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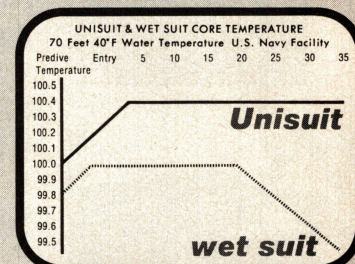
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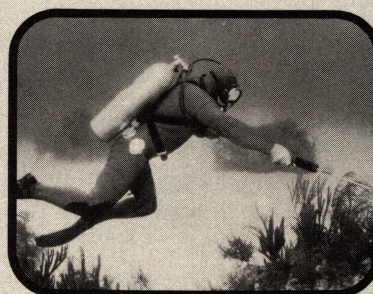


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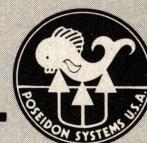
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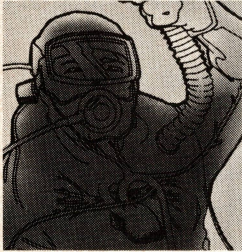
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# skin diver

VOLUME TWENTY-FIVE NUMBER TEN



34/Cool Factor

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### cover

Jim Cooluris took this photograph of a jellyfish in 30 feet of water off Santa Cruz Island, one of the Northern California Channel Islands. He used a Nikon camera with Micro Nikkor lens in Oceanic housing with Oceanic 2001 strobe.



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# Editorial

## What's Wrong with The Octopus?

by the Publisher

In order to get to the root of instructor resistance toward octopus rigs, SKIN DIVER Magazine has probed the many problems and complaints clouding this issue. Why is the resistance so strong toward this apparently progressive safety apparatus? And what is being done to resolve the issue?

Perhaps the most often voiced argument among dive enthusiasts is that octopus rigs are too expensive. Admittedly, octopus units do represent an additional cost of \$50 to \$75 per unit, while buddy breathing is free. However, there are some obvious faults with this kind of thinking.

The octopus rig represents a new and advanced step in scuba safety equipment. Additional safety equipment is going to cost additional money, but the price is justified when a life is at stake. Safety equipment is always expensive regardless of whether the sport is scuba diving, flying or boating.

Many divers try to rationalize their refusal to purchase safety equipment by making statements of infallibility such as, "I'll never run out of air," or "I can always make an emergency ascent," or "I'm a good buddy breather." Somehow these arguments sound hollow when you see the body of a former dive buddy lying cold and wet and dead on the boat deck or beach after a fatal accident.

The point is that people make mistakes. They've been doing it ever since Adam took a big bite out of the forbidden fruit. It is human nature to err and that's why they put erasers on pencils. Suffice to say that if a person dives long dives and often enough, there is a good chance he or she will run out of air at least once. Divers should follow the basic rules of safe diving, but they should also be *fully prepared* for any underwater emergency. The octopus is not a consumer rip-off contrived by dive shop dealers and manufacturers —

it is a valid piece of safety equipment which can, and has, saved lives.

The argument against the octopus most often heard among dissenting instructors is that there are not enough units presently in use. Their refusal is based on the fact that only an estimated 10% of the regulators now in use have octopus hook-ups. While this estimate may be fairly accurate, it is not a valid argument for continued neglect of octopus training. No doubt the very same protest was made when buoyancy compensators and submersible pressure gauges were first introduced. There is a natural and normal tendency to resist change and evolution, but the fact remains that octopus usage *is growing* and that the percentage of units in use may be much higher than estimates made six months or a year ago.

A good example of octopus acceptance by consumers is a recent report from Florida dive shop owner, Dave Inman. Located in the Hollywood/Ft. Lauderdale area, Divers Unlimited trains and certifies approximately 100 divers a month. Students are taught both buddy breathing and octopus techniques, and the result is 80% of the students certified end up by buying octopus units. What makes this store so different from the averages previously quoted? This shop and its instructors have made a definite commitment to the proper training of octopus usage, starting with rental regulators being equipped with octopus units.

There is an important lesson to be learned from this situation. The choice of octopus usage should be the prerogative of the consumer — not the instructor. Instructors should provide adequate training and practice in both buddy breathing and octopus techniques so that the student can make an intelligent decision on his own. Omission of octopus training by the instructor amounts to unfair censorship. The student is being shortchanged.

Instructors who remain staunch believers in the buddy breathing system, tend to think of the octopus as a threat to established safety practices. They fear that adoption of the octopus concept would mean the abolition of buddy breathing. This need not necessarily be the case, and for the time being it is really impossible to tell. A more important consideration at this point is that both concepts be taught with equal attention and vigor. Both concepts are currently in practice on a widespread basis, and therefore the student must be fully acquainted with their existence and application.

It is only fair to point out several problems which *do surround* the octopus concept. There are legitimate arguments which require the attention of the major instructor associations. First of all, no published standards on the use and training of the octopus exist at this time. There is great confusion over the manner in which an octopus should be worn and how it must be efficiently utilized. A wide range of procedures has been proposed by various instructors, but there is still no universal agreement.

As with most new ideas, the octopus has created as many new problems as it was designed to solve. The instructor associations are very much aware of the need for standardization and most all of them have instituted programs of survey and study. The coming months should prove interesting as more attention is devoted to resolving this dilemma.

So far as can be determined at this time there is nothing wrong with the concept of the octopus — nothing that cannot be resolved with a combination of time and effort on the part of the scuba instructors themselves. Isn't it time that we begin taking advantage of the rapidly advancing technology within our industry, and begin to apply these contributions to the betterment of our sport's safety record?





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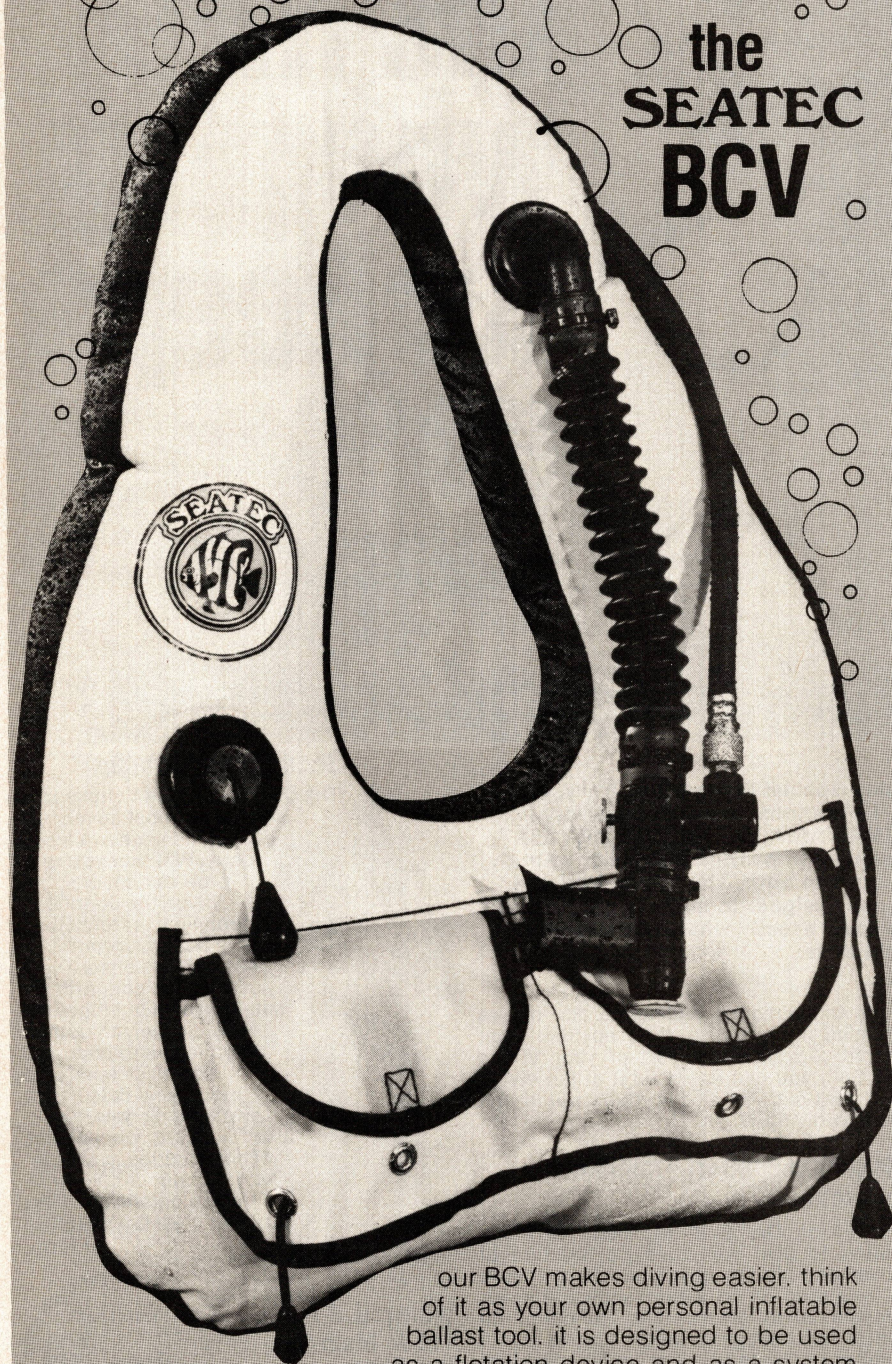
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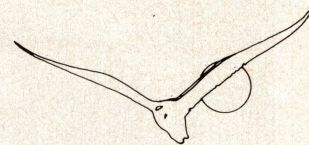
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## Calendar



October 1-4

Man and the Sea 1976, Chevron Hotel, Sydney, Australia (Contact: Man and the Sea, P.O. Box 40, Spit Junction, N.S.W. 2088, Australia)

October 9

Seamark '76, New England Aquarium, 7:30 p.m. (Contact: Tony Salerno, 105 Beech St., Fitchburg, MA 01420 (617) 343-3526)

October 29-30

Underwater Film Festival & Photo Contest, Honolulu, HI (Contact: Roy Damron, 954 Kului Palace, Honolulu, HI 96821)

November 1

14th Annual International Underwater Photo Competition (Contact: Underwater Photographic Society, P.O. Box 7088, Van Nuys, CA 91409)

November 5-7

8th International Conference on U/W Education, Convention & Performing Arts Center, San Diego, CA (Contact: NAUI Hdqrs., P.O. Box 630, Colton, CA 92324)

November 7-11

1st International Meeting on Underwater Activities, Eilat. (Contact: Red Sea Underwater 1976, P.O. Box 29234, Tel Aviv, Israel)

November 13-14

Florida Skin Divers Association annual meeting, Jacksonville, (Contact: Skip Elmes, Bold City Divers, Inc. P.O. Box 52171, Jacksonville, FL 32201)

January 5-8

8th Int'l Conference on U/W Archaeology, Government Conference Centre & Chateau Laurier Hotel, Ottawa, Ont., Canada (Contact: Jervis D. Swannack, 1600 Liverpool Court, Ottawa, Ont., Canada)

January 15

Inland Divers Association 4th Annual Film Festival & Underwater Photography Contest. (Contact: IDA, Doris Williams, 6215 Dodson Ter., Ft. Worth, TX 76135)

March 5

Boston Sea Rovers '77, Boston, MA (Contact: Bunky Hodge, 174 Beech St., Rockland, MA 02370)

April 16

Underwater Symposium 77, Harvard University Science Center, Cambridge, MA (Contact: Fred Calhoun, P.O. Box 291, Back Bay Annex, Boston, MA 02117)

April 16

Underwater Film Review, John Hancock Hall, Boston, MA, 8 p.m. (Contact: Fred Calhoun, P.O. Box 291, Back Bay Annex, Boston, MA 02117)



# skin diver

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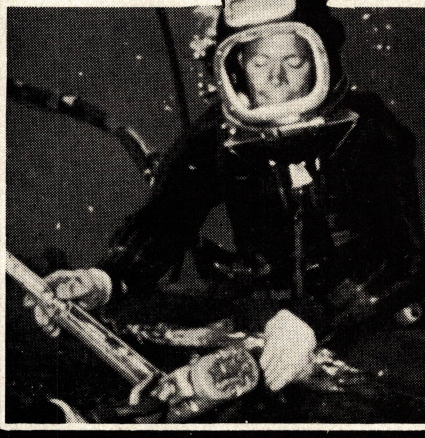
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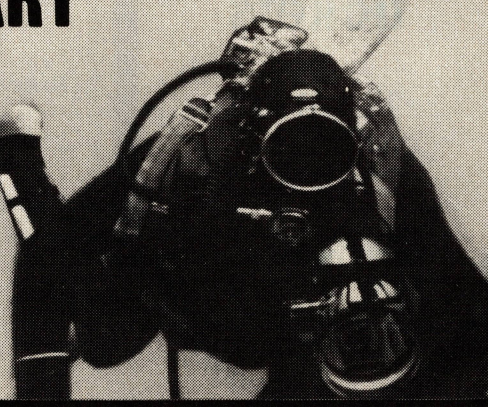
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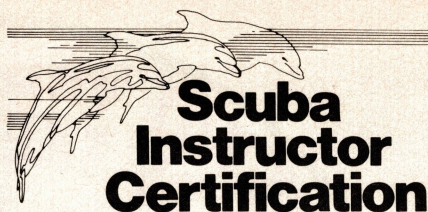
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Butler, FPO Seattle, WA 98773)

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PADI Instructor Training Course,  
Winston-Salem, NC. (Contact: Robert  
Outlaw, Rt. 6, Box 558, Thomasville, NC  
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October 4-10

YMCA Instructor Institute, Key West, FL  
(Contact: Tom Mount, P.O. Box 1547,  
Key West, FL 33040)

October 4-9

SSI Photography Instructor's Clinic, San  
Salvador (Contact: SSI Hdqrs., 1634 S.  
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October 4-December 10

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October 10-15

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Ushigome, Tokyo, Japan)

October 16-23

PADI Instructor Training Course,  
Chicago, IL (Contact: Phil Godbold, 1665  
Lomaland Dr., El Paso, TX 79935)

October 18-30

SSI Instructor Clinic, Austin, TX (Contact:  
SSI Hdqrs., 1634 S. College Ave., Ft.  
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October 31-November 6

YMCA Scuba Instructor Institute, Belize,  
C.A. (Contact: Harry Caldwell, 829 N.  
Starrett Rd., Metairie, LA 70003)

November 1-11

SSI Instructor's Clinic, Louisville, KY  
(Contact: SSI Hdqrs., 1634 S. College  
Ave., Ft. Collins, CO 80521)

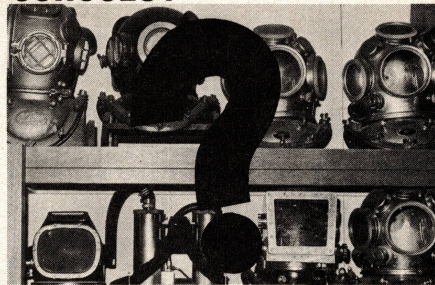
November 1-12

SSI Instructor Clinic, Louisville, KY (Con-  
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November 6-December 5

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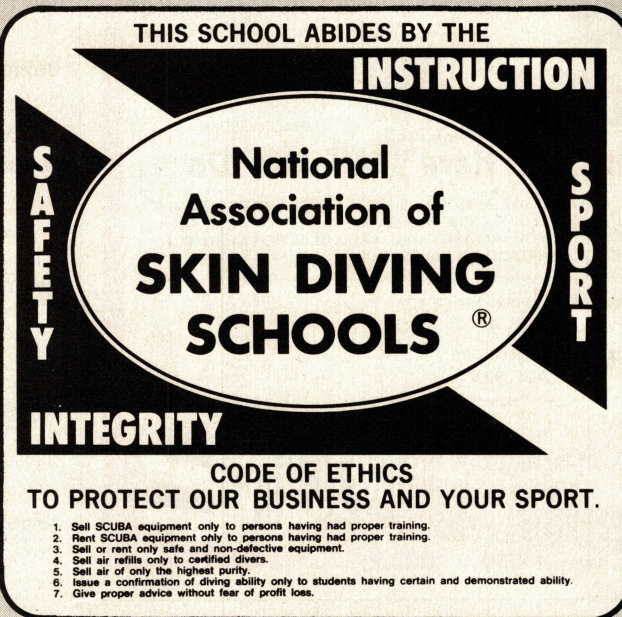
# IF N.A.S.D.S. HAS SUCH A GREAT PROGRAM, WHY DO THEY HAVE LESS THAN 400 MEMBER STORE/SCHOOLS?

There are supposed to be over 1000 retail diving schools in the diving industry, but N.A.S.D.S. defines a PROFESSIONAL diving store eligible for N.A.S.D.S. membership as a retail store/school that teaches, has facilities for repairs, and a compressor for servicing our customers needs.

That is just the beginning of the restrictions N.A.S.D.S. demands of its members.

They must abide by our code of Ethics; the same one we have had since 1962.

All N.A.S.D.S. instructors MUST attend an instructional sales clinic,



ic, or our ten week Vocational Instructional College to learn our methods of teaching and how to best serve our customers. N.A.S.D.S. does not have "cross over" certifications.

In order for a N.A.S.D.S. instructor to issue the N.A.S.D.S. certification card, he has to work for a member retail school. This gives N.A.S.D.S. the quality controls necessary to certify the most knowledgeable instructors in diving.

Any store/school that applies for membership is reviewed by a Regional Board in the area in which the business ethics by which the store/school operates. the truth is, N.A.S.D.S. rejects an average of four out of ten applications for membership.

Why do diving store/schools belong to N.A.S.D.S.? It could be our exclusive insurance program, the only one in diving. Our members know it is because of our restrictions and the fact that it is only human nature to want to belong to the best, and the best are the store/schools accepted by N.A.S.D.S. as members.

**For more information about the N.A.S.D.S. program, write to: N.A.S.D.S., P.O. Box 7666, Long Beach, California 90807. We will be glad to send you our membership list of ethical diving retailers throughout the world.**

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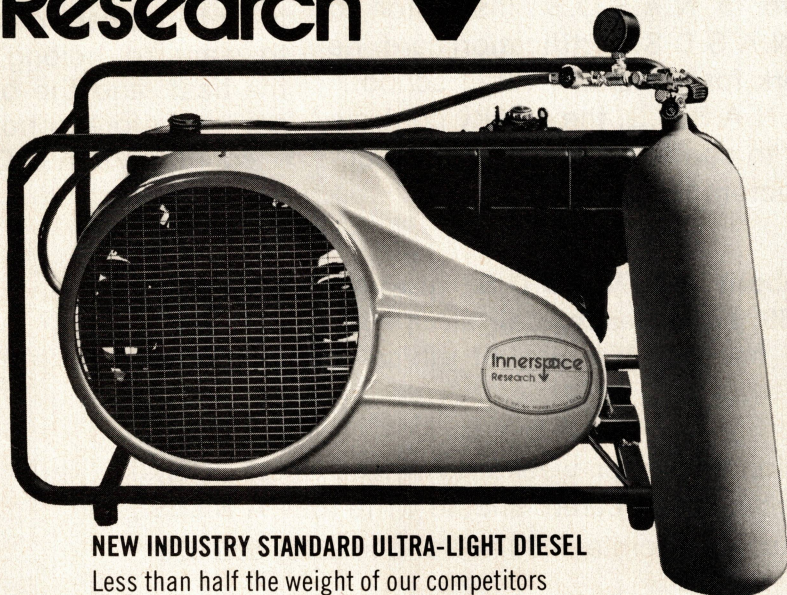
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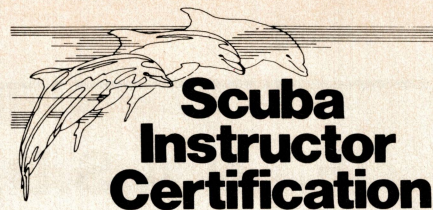
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December 5-10

NASDS Clinic, Florida (Contact: NASDS, P.O. Box 7666, Long Beach, CA 90807)

December 13-19

PADI Instructor Training Course, Jacksonville, FL (Contact: Fla. PADI College, 4593 St. Johns Ave., Jacksonville, FL)

December 20-26

PADI Instructor Training Course, Jacksonville, FL (Contact: Fla. PADI College, 4593 St. Johns Ave., Jacksonville, FL)

January 3-March 11

PADI Instructor Training Course, Jacksonville, FL (Contact: Fla. PADI College, 4593 St. Johns Ave., Jacksonville, FL)

January 9-March 27

26th Los Angeles County Underwater Instructors Certification Course, pre testing Dec. 4-5 (Contact: L.A. County Dept. Parks & Recreation, Underwater Unit, 155 W. Washington Blvd., Los Angeles, CA 90015 (213) 749-6941 ext. 636)

January 9-15, 1977

NAUI Instructor Training Course, Honolulu, HI (Contact: Roy Damron, 954 Kului Pl., Honolulu, HI 96821)

March 4-6, 18-20

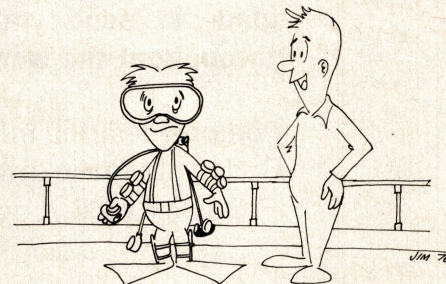
YMCA Instructor Certification Institute, Olympia, WA (Contact: Bill Allen, Rt. 8, Box 344-B, Olympia, WA 98502)

April 15-17, 28-30-May 12-14

YMCA Scuba Instructor Institute, Boca Raton, FL (Contact: Doug Curtis, P.O. Box 642, Boca Raton, FL 33432)

May 21-27

YMCA Instructor Institute, Key West, FL (Contact: Tom Mount, P.O. Box 1547, Key West, FL 33040)



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# PSSST!

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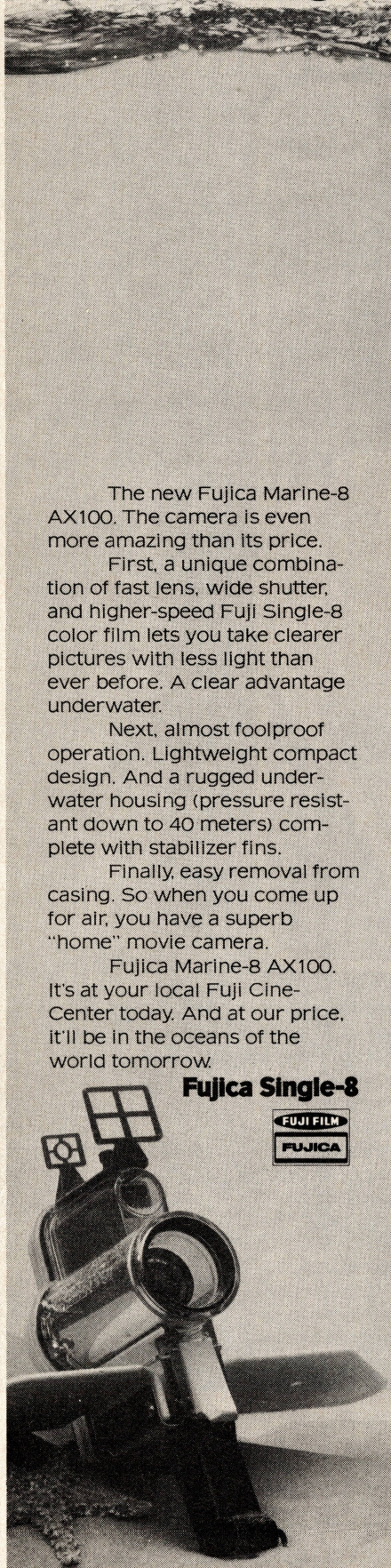
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SD/RP/10



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The new Fujica Marine-8 AX100. The camera is even more amazing than its price.

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## Underwater Forum

### Diving in Contaminated Waters

... Many of the beaches on Long Island, New York have been closed this year due to contamination. Are there any recommended immunizations that might help a diver planning to dive these areas?

RUDY DUBIN NEW YORK

*It's best to check with the people who have quarantined a beach, usually the local health department, for info on the hazards involved. Most often in this country, as in the recent New York closures, the problem is sewage and the hazard is infection with organisms from human feces. If you anticipate possible exposure, obtain typhoid vaccination, and see that your tetanus protection is up to date.*

*Your biggest risk is probably hepatitis. You can get this from swimming in polluted water, or eating inadequately steamed clams taken from areas of relatively little pollution. There's no vaccine, but gamma globulin shots at intervals of six weeks to several months may confer some protection.*

*But don't take anything for granted. In some locales, especially foreign, beach closure may be for other reasons, such as jellyfish invasion or shark sightings.*  
C. V. BROWN, MD

### More About Sharks

... I am so glad that there finally has appeared an article, written for the lay public, that has something kind and reasonable to say about the much maligned shark. Albeit Dr. Eugenie Clark and others have been working and studying sharks and their behavior, scientific reports are often not read by the general public. Now that Rhett McNair's article has appeared and will hopefully be read by the majority of the diving public, perhaps my buddies won't think me so crazy for not being afraid of sharks, but merely of having a great amount of respect. Thanks for the good article.  
JOYCE TEERLING, PH.D.

STUART, FLORIDA

### Save Our Whales

... Your magazine should be commended for the many articles on the whale crisis that you have published. It is only with this type of public exposure

## CAN YOU MEET THE CHALLENGE?



The demand for well trained commercial divers has increased both in the domestic and overseas market, now is the time to train for your future.



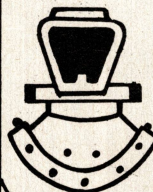
From all stand points — as a business, a potential market, or as a career opportunity — the outlook for the future is extremely favorable.



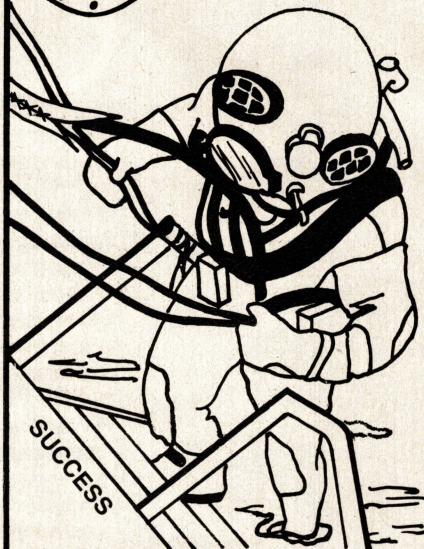
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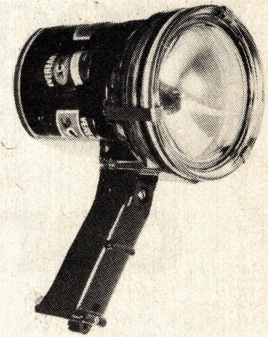


# 7 ways to turn on 6 from ikelite



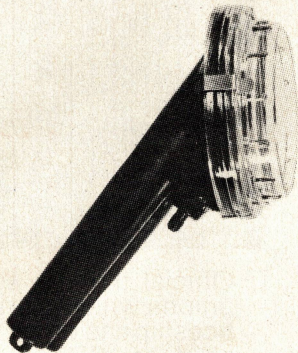
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Sales leader of all popular under-water lights.



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This light provides intensity unequalled by any popular priced diving light.



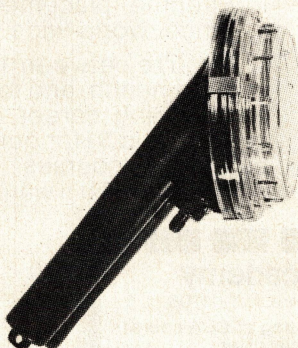
## C-LITE I

Greater intensity than lantern battery powered lights.



## MODULAR X

Produces intensity almost equal to a C-Lite II. Actually matches the brightness of other make rechargeable lights.



## C-LITE II

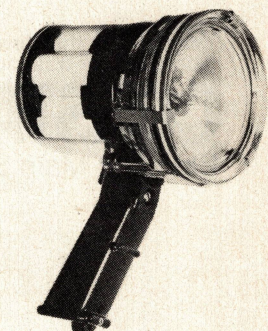
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*RJ Shourot*

**Robert J. Shourot**  
Director, Coastal Diving Academy  
President, Coastal Diving Operations, Inc.  
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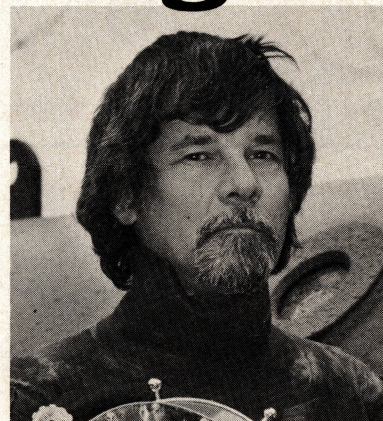
Coastal Diving Academy produces top-notch professional divers. And while we can't guarantee that every graduate will get a job, our record is outstanding.

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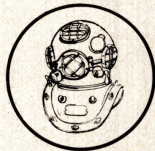
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SD-10





## Underwater Forum

that people will realize how near the great whales are to extinction.

To address this problem there is now a country wide boycott on the two offending countries, Russia and Japan, who still continue indiscriminate whaling.

This boycott includes the knowing purchase of any product from, travel to, or traffic with these two countries. . . For additional information about the boycott contact RARE % National Audubon Society, 950 Third Ave., New York, N.Y. ROBERT MCGINNIS

HOFFMAN ESTATES, ILL.

. . . In regard to Bill Barada's article entitled "Vanishing Leviathan." I would like to commend him on his very timely piece. Perhaps something can be done this year

at the Law of the Sea Conference to protect all marine mammals (seals, dolphins, whales, manatees). However; one correction should be made to a fact listed . . . Although sperm whales are highly valued for their oil, they are not used for human consumption. The only major consumers of sperm whale meat are minks and other fur bearing animals in the Russian fur industry. Also of interest to your readers; the American tuna fleets have been stripped of their purse seine nets by a federal court order handed down in May. A step in the right direction, finally.

CHARLES H. GREENE

BOULDER, COLORADO

Unfortunately, the effectiveness of Bill Barada's otherwise superb article "Van-

ishing Leviathans" was seriously shaken by the quote from *Moby Dick* which, when taken completely out of context, seems to suggest that Herman Melville foresaw the extinction of the whale over 100 years ago. In fact Melville, who had no way of predicting the merciless improvements in whaling technology, concluded the exact opposite later in the same chapter from which Barada's quote is taken: ". . . we account the whale immortal in his species, however perishable in his individuality. He swam the seas before the continents broke water, he once swam over the site of the Tuileries, and Windsor Castle, and the Kremlin. In Noah's flood he despised Noah's Ark, and if the world is to be again flooded, like the Netherlands, to kill off its rats, then the eternal whale will survive, and rearing upon the topmost crest of the equatorial flood, spout his frothed defiance to the skies."

BARNEY BLACK

NORFOLK, VA.

### Flying and Diving

. . . The Scuba IQ in the June issue was unclear about flying after diving. Since I generally fly after diving, I am concerned about the following: What are the best dives to make, if flying commercially within a four to six hour period after diving? . . . After two 40 minute, 50 foot maximum dives, how long should one wait before flying commercially? . . . After one 50 minute, 125 foot maximum

# THE BUDDY CONNECTOR

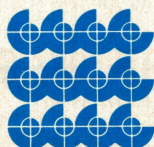
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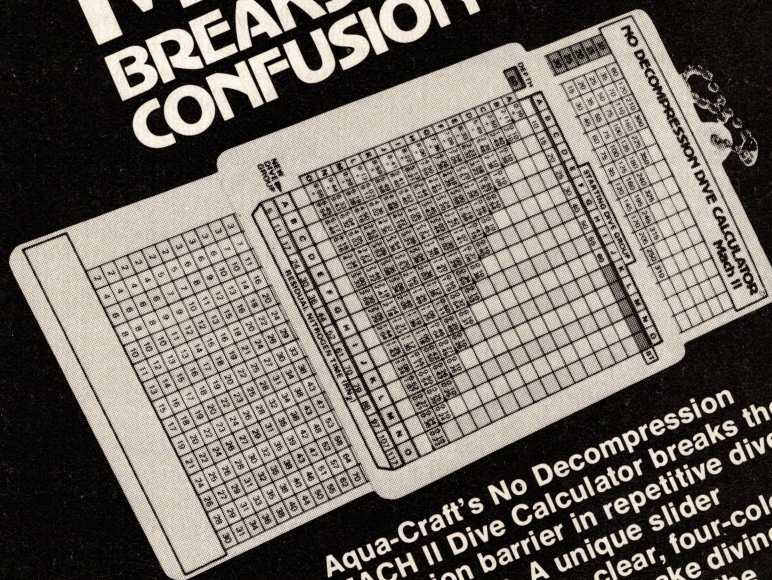
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## Underwater Forum

dive, how long should one wait before flying commercially? . . . Is it safe to fly commercially, shortly after (two to three hours) making one or two no-decompression dives?

I have been told not to dive in the morning if I am going to fly in the afternoon and it sure is killing a lot of days.  
HENRY SHURE

LOS ANGELES, CALIF.

. . . The simple answer to all these questions is to wait until you are in repetitive dive group D before flying commercially. This is a delay of less than four hours after most sport dives, and only 4½ hours after the most severe dive allowed by the Navy tables. The best dives to make before flying are, of course, those which result in the lowest repetitive group letter, which generally mean short exposure no-decompression dives.

After two 40 minutes dives to 50 feet, the highest group letter upon surfacing is J. The required surface interval in this case before flying (required to reach group D) is 3 hours and 5 minutes.

A 50 minute dive to a 125 foot maximum is a severe exposure, requiring three decompression stops and more than one hour ascent time. If this schedule were followed, the diver would surface in group O, from which a delay of 4 hours, 18 minutes is necessary to reach group D. It is not recommended that one fly within 12 hours of a decompression dive, however, especially after one as severe as this. If dives are made which require decompression stops according to the Navy tables (regardless of any decom meter readings), the best advice is to wait 12 hours before flying.

The kind of dives which would permit flying within two to three hours are, for example, 50 feet for 50 minutes or 100 feet for 22 minutes.

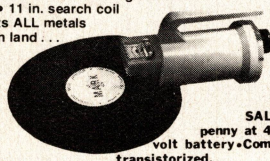
It is a good idea to avoid flying in the afternoon following a morning dive if possible, as the actual risks are not well known. If it must be done, a delay at sea level of four hours or more is the next safest procedure, and waiting a full 12 hours is recommended following any dive requiring decompression stops.

C. L. SMITH LOS ANGELES, CALIF.

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- Constructed of high impact epoxy • Sensitive meter for indication • Single control knob • 11 in. search coil
- Detects ALL metals
- Use on land . . .

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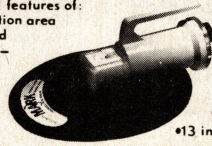


. . . or in fresh or SALT water • Detects a penny at 4 ins. • Standard 9 volt battery • Completely transistorized.

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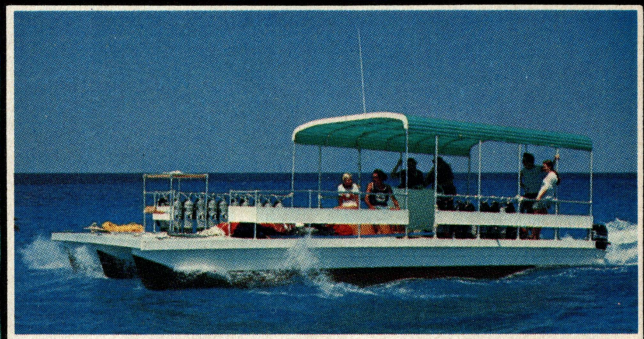
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Paul J. Tzimoulis, Publisher  
*Skin Diver Magazine*



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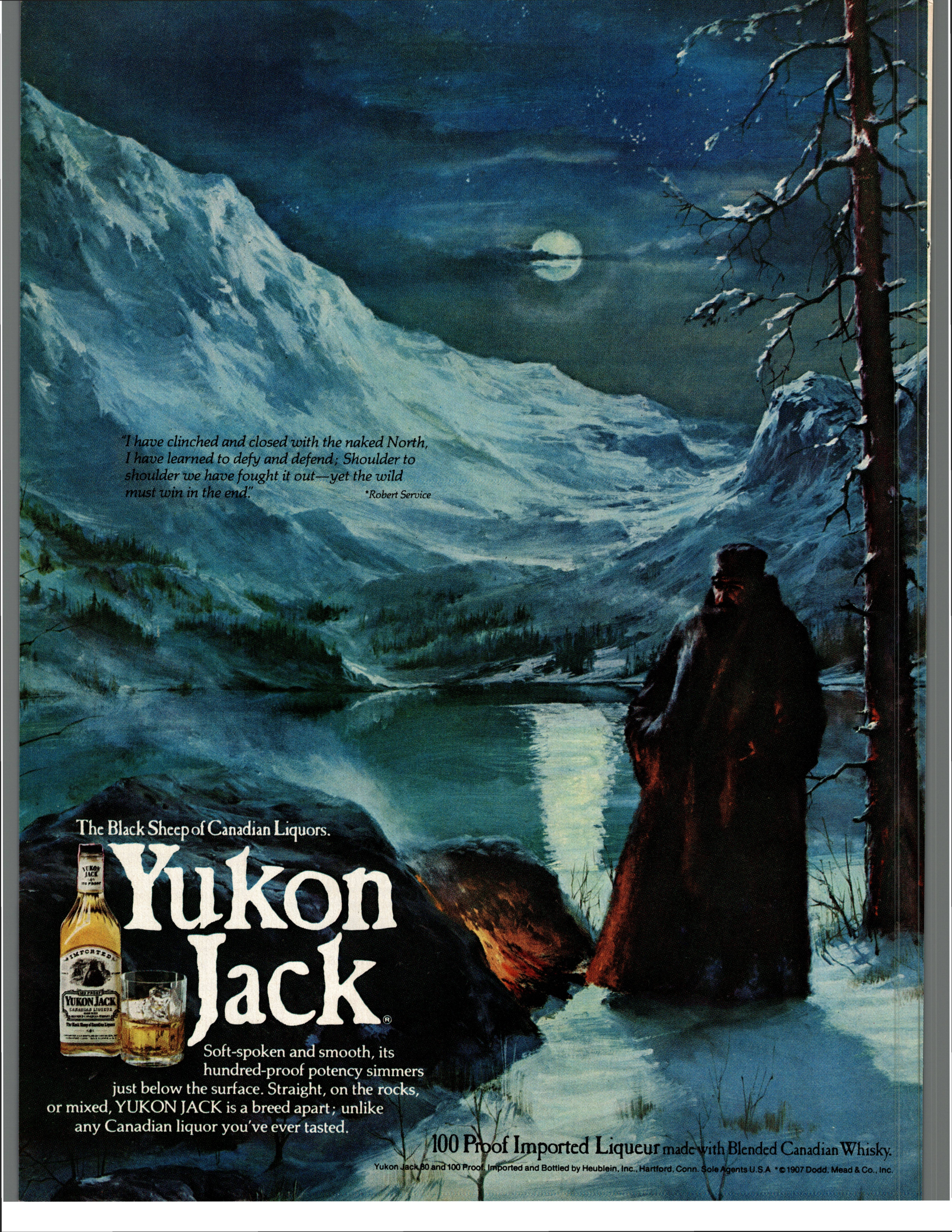
NAME \_\_\_\_\_ PHONE \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

SDO





*"I have clinched and closed with the naked North,  
I have learned to defy and defend; Shoulder to  
shoulder we have fought it out—yet the wild  
must win in the end."*

*\*Robert Service*

The Black Sheep of Canadian Liquors.



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# Scuba I.Q.

## Test Your Dive Knowledge

### What's Your Wreck Diving IQ?

Mystery, excitement, adventure and artifacts attract divers to wrecks. There are many things a diver must know and be able to do in order to explore and penetrate wrecks safely. Test your knowledge of wreck diving by selecting the most correct answer to each of the following questions. Answers are on the following page.

- 1) **Wrecks are most commonly found in:**
  - ☐ A. Shallow water with good visibility.
  - ☐ B. Deep, dark and cold water.
  - ☐ C. The southeastern United States.
- 2) **What is the most important information to acquire when researching a wreck to plan a dive:**
  - ☐ A. Date of sinking and cause.
  - ☐ B. Artifacts and cargo carried.
  - ☐ C. Name, depth and dimensions.
- 3) **Salvage work performed on wrecks may require:**
  - ☐ A. A license from the U.S. Dept. of Marine Salvage Operations.
  - ☐ B. A permit from local government agency, insurance company or owner.
  - ☐ C. Approval from the local U.S. Coast Guard.
- 4) **Which of the following items are not typically encountered on wrecks:**
  - ☐ A. Fishing nets and trawling wire.
  - ☐ B. Sails and rigging.
  - ☐ C. Fishing line and hooks.
- 5) **Dangerous marine life frequently found near East Coast wrecks include:**
  - ☐ A. Spiny fish, moray eel or sea urchin.
  - ☐ B. Cone shell, lion fish or sea wasp.
  - ☐ C. Shark, barracuda or octopus.
- 6) \_\_\_\_\_ **can affect the stability of a wreck, any loose rigging and the diver's mobility:**
  - ☐ A. Surface traffic.
  - ☐ B. Depth of water.
  - ☐ C. Currents.
- 7) **When diving inside a wreck, which following safety precaution should be taken:**
  - ☐ A. Leave a light outside the entrance to mark the exit.
  - ☐ B. Carry a slate for mapping route during penetration.
  - ☐ C. Secure a penetration line to the outside of the wreck.
- 8) **When exploring the interior of a wreck, a diver should have:**
  - ☐ A. Two tanks with separate regulators.
  - ☐ B. Double tanks, underwater lights and a watch.
  - ☐ C. A safety line and two underwater lights.
- 9) **One must move slowly and carefully inside a wreck to:**
  - ☐ A. Prevent silt from ruining visibility.
  - ☐ B. Prevent entanglement with surrounding objects.
  - ☐ C. Both of the above answers are correct.
- 10) **Orientation inside wrecks is often difficult due to:**
  - ☐ A. Colder water affecting equilibrium.
  - ☐ B. Darkness and listing of the wreck.
  - ☐ C. Black water and silting.
- 11) **The mouthpiece should not be removed when entering an air pocket within a wreck because:**
  - ☐ A. Oxidation may have depleted available oxygen.
  - ☐ B. Air breathed under pressure may cause embolism.
  - ☐ C. The decompression schedule will be altered.
- 12) **Shifting of the wreckage, shifting of cargo or collapsing of structures would most likely be caused by:**
  - ☐ A. Tidal currents.
  - ☐ B. Exhaust bubbles.
  - ☐ C. Thermoclines.
- 13) **Which of the following types of lines should be used when wreck diving:**
  - ☐ A. Buddy line, 100 foot nylon line and 300 foot stern line.
  - ☐ B. Anchor line, penetration line and surface buoy line.
  - ☐ C. Ascent line, penetration line and stern line.
- 14) **Which additional pieces of equipment should be used for wreck diving:**
  - ☐ A. Wire cutters, line reel and octopus.
  - ☐ B. Underwater lights, penetration line and pony bottle.
  - ☐ C. Lifting bags, pressure gauge and buoyancy compensator.
- 15) **Wreck diving can be dangerous because of:**
  - ☐ A. Marine life, entanglement and entrapment.
  - ☐ B. Disorientation, apprehension and silt.
  - ☐ C. All of the above hazards.



# Scuba I.Q.

## Test Your Dive Knowledge

### What's Your Wreck Diving I.Q.?

#### Answers from questions on page 21.

- 1) B. Deep, dark and cold water. Wrecks are more likely to occur where conditions are less favorable. Because a great many wrecks are found in cold, dark and murky water, apprehension of the diver adds to the difficulty in wreck diving.
- 2) C. Name, depth and dimensions. Knowledge of the water depth and the area to be covered will be valuable in dive planning. The name of the vessel will help assure the correct wreck is being explored. Also learn the reason for the sinking of the wreck and be careful your boat does not meet with the same fate.
- 3) B. A permit from local government agency, insurance company or owner. Before salvaging any artifacts from wrecks, obtain required permission from the legal owners.
- 4) B. Sails and rigging. These items deteriorate relatively quickly, but wrecks are havens for fish and attract both sport and commercial fishermen who keep the wrecks freshly adorned with all manner of netting and tackle. Divers must use caution to avoid entanglement and should carry a sharp knife.
- 5) A. Spiny fish, moray eel or sea urchin. Wrecks form artificial reefs which attract, in addition to fish, many forms of marine life, some of which are potentially dangerous. Be sure to find out what animals are common to the area prior to diving on a wreck.
- 6) C. Currents. Dive the lee side of a wreck whenever possible and use caution at either end where the current will be encountered. Watch for rigging swept along by the current. Also trail a stern line from the surface boat to assist in returning to the boat should the divers surface downstream from the boat. Check tide tables to avoid tidal currents.
- 7) C. Secure a penetration line to the outside of the wreck. When entering a wreck, a diver must use a safety line to insure safe passage out of the maze of passageways and chambers.
- 8) C. A safety line and two underwater lights. In addition to the safety line to follow, the diver must have an underwater light to illuminate the darkness inside the wreck and a backup light in case of failure of the primary light.
- 9) C. Both of the above answers are correct. Disturbed silt in the interior of a wreck can completely eliminate all visibility. Entanglement and entrapment are possible, there are sharp objects and some of the cargo may be dangerous. Wreck penetrations should only be attempted by divers trained in wreck diving techniques and procedures.
- 10) B. Darkness and listing of the wreck. Limited visual reference and the uneven lay of a wreck can cause disorientation inside wrecks. Watch your surroundings carefully for proper orientation.
- 11) A. Oxidation may have depleted available oxygen. Air trapped in chambers inside wrecks may not contain oxygen to support life or could contain toxic or corrosive gases. Do not breathe trapped air.
- 12) B. Exhaust bubbles. The lift of air caught and trapped inside wreckage can cause the wreck to shift or various parts to break apart creating hazardous situations. Be alert to the effect of your exhausted air if remaining stationary for very long inside a wreck.
- 13) C. Ascent line, penetration line and stern line. The penetration line is a safety line used when entering a wreck; the stern line is trailed from the surface boat to help divers return to the boat; and the ascent line is attached to the wreck to control the ascent in a current or if decompression should be required.
- 14) B. Underwater lights. Actually all the equipment listed should be used for wreck diving, but B is the most correct answer. The need for lights and penetration line has already been presented and a pony bottle — a small, separate air supply — should be carried.
- 15) C. All of the above hazards. There are many potential dangers to the diver in wreck diving, but these dangers can be safely coped with when divers are properly trained for this specialty aspect of the sport.

#### MORE ABOUT WRECK DIVING

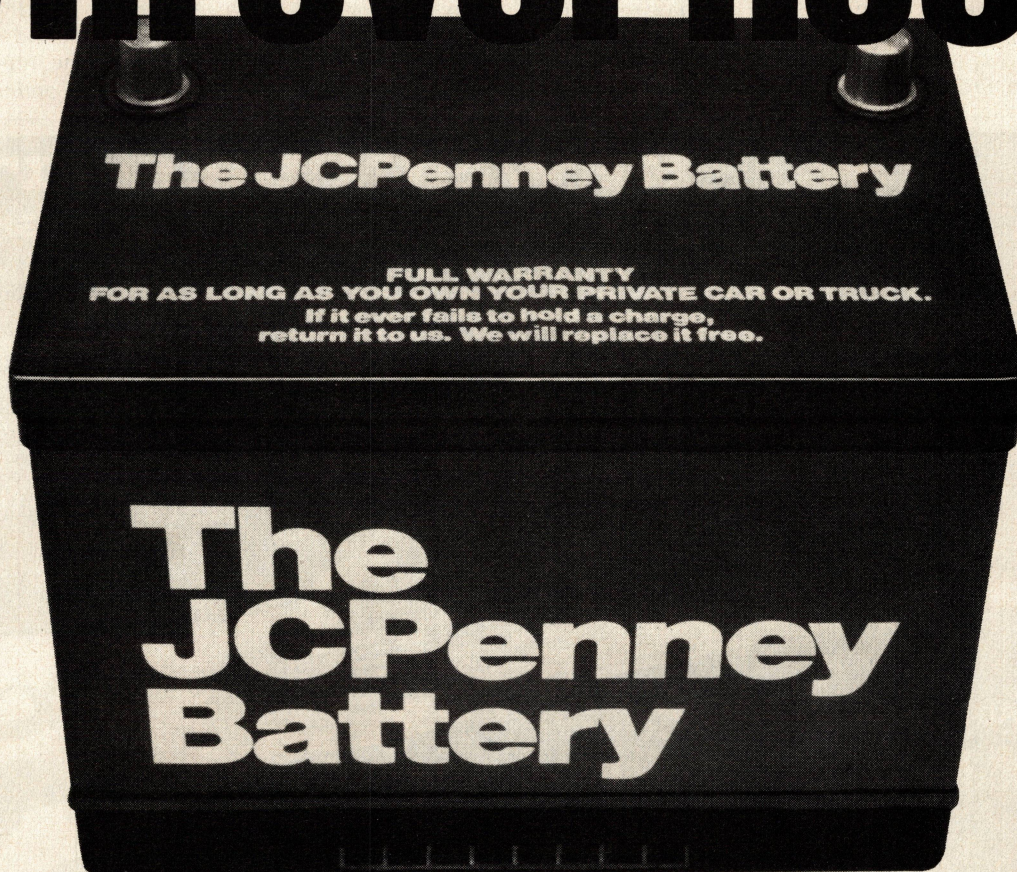
Wreck diving ranges from a pile of overgrown rubble in shallow, clear and warm water to large intact vessels with mazes of passageways and holds in the deep, dark and cold depths. Investigating the quiet wrecks in the waters of Tobermory in Canada is vastly different than diving on the remains of ships in the strong currents off the Jersey coast. A diver familiar with the techniques for diving the wrecks in one area is not qualified to dive the wrecks in another area. Just as in regular diving, where an orientation to any new environment or aspect of the sport is needed, experienced wreck divers should be oriented to the hazards and procedures of diving on wrecks in any new area. Even though a diver may be trained and certified for a particular skill or specialty, that person is actually only trained to engage in the activity for the particular environment in which trained. Under exactly the same conditions, a wreck diving experience can be beautiful and exciting, or it can be dangerous and harrowing. By being trained, oriented to the wreck and the area, properly equipped, and prepared with thorough planning, your wreck dives can be enjoyed in safety.

There are groups of wreck diving specialists on both coasts and in the Midwest. If you are interested in developing your ability as a wreck diver, contact their local organizations or the headquarters' office.

*Unless you are an experienced and trained wreck diver, it is hoped that you did not score well on the exam. The object of the test is to make divers aware of the problems involved in the specialty of wreck diving. Before engaging in wreck diving, especially when it involves penetration, be sure to take a wreck diving course. Next month's exam is on Freshwater Diving.*



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# Technifacts

## from a Master Diver

by  
E. R. Cross



The basic purpose of this column is to stimulate an interest in the technical aspects of diving and in dive safety. It will be devoted to providing factual answers to questions from SKIN DIVER readers. Answers will be designed to apply to the majority of dive situations, problems, and equipment encountered in today's diving. Single subject questions are best suited to Technifacts and may be on any subject related to diving. Watch for your answers in Technifacts.

For their questions and comments used in this month's Technifacts I would like to thank Don Heffernan, Chicago, Illinois; Steve Loman, Sierra Madre, California; Dennis K. Sponholtz, Amherst, N.Y.; and Jeffrey Howe, Amherst, Mass.

*Decompression Problems!* The prac-

tice of using a long shallow water dive (at a depth of 33 feet or less) as a form of or part of a decompression program is widespread. The reader's letter quoted below indicates some of the confusion that exists about this practice.

"The U.S. Navy dive tables are based on the theory that as long as tissue nitrogen tension is not allowed to exceed two times ambient nitrogen pressure no bubbles will form. This is the reason", the reader continued, "that an unlimited dive to a depth of less than 33 feet is considered safe. With these facts in mind it appears that after a safe ascent within the time limits of the tables, an immediate repetitive dive, not to exceed 33 feet, would be safe regardless of the time of the repetitive dive. It further appears that when ascending from a deep dive

within the no-decompression limits, one could stop in the 33 feet to zero range for as long as desired and then come directly to the surface. In fact it would seem that dallying at the 33 foot or less range would be safer than a direct ascent. Can you comment on this?"

There are several areas of concern with the thinking as described above. First, the Navy decompression tables take into consideration many factors other than the two-to-one rule outlined previously. Depth, time, tissue saturation rates, degree and type of work, water temperature, and other factors dictate deviation from a strict two-to-one rule.

Secondly, stating that an unlimited dive to a depth of 33 feet is absolutely safe is not necessarily true. At least one case of bends has occurred following a dive to that depth. Obviously a near-totally saturated condition following such a dive would be "pushing" the tables just as much as would any other case of "pushing" the tables. And it would be just as dangerous.

With the two previous suppositions being in error it follows the remaining assumptions are not accurate. Let's follow a decompression problem involving no decompression and then take the diver to a shallow depth following the dive. Assume the first dive was to a depth of 100 feet for a period of 22 minutes (3 minutes under the no-decompression

(Continued on Page 90)

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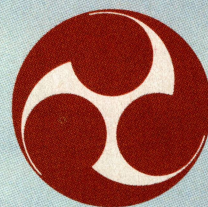
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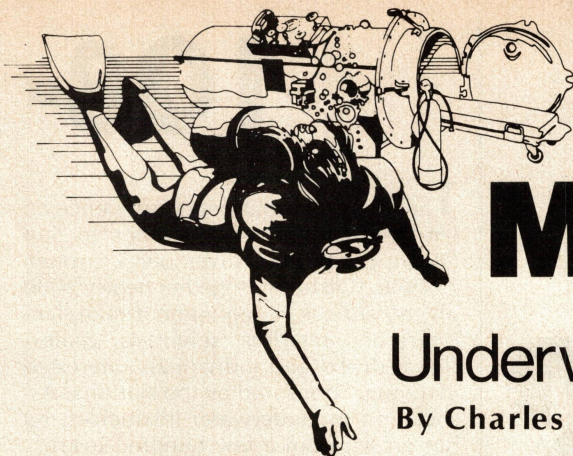
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# Medifacts

## Underwater Blackout

By Charles V. Brown M.D.

**Y**ou glide entranced through timeless seas. Such wonder needs sharing — you look for your buddy. Could that be him 20 feet back, immobile, or maybe unconscious? You react like any well trained intelligent diver — you panic. After about five hours (five seconds by your watch, which must be awfully slow) you speed to the rescue. What happened?

For years, underwater blackout has been an enigma. In the classroom it confuses both students and their instructors — those who mention it at all. In the water it strikes swiftly, without apparent cause. Though little feared or even thought about, it kills far more divers than do sharks. All divers know the standard ways to conk out below — entanglements, injuries, O<sub>2</sub> seizures, etc., but we're concerned here with something more subtle and mysterious.

Textbooks have long told of "shallow water blackout" and admitted it was poorly understood. Recently trained divers may feel they do understand it, since the current crop of manuals define it as the collapse which befalls free divers who hyperventilate first. However, the expression "shallow water blackout" was coined several decades ago in England to describe an abrupt loss of consciousness seen occasionally in British naval divers using O<sub>2</sub> rebreathers. Dr. Stanley Miles, in his book *Underwater Medicine*, said the name was chosen because of lack of any specific finding in the victims. He also pointed out that depth was not really a factor. The word shallow probably sneaked in by accident; the victims had avoided deep water merely because they were using O<sub>2</sub>.

In 1956 the Royal Canadian Air Force reported "episodic unconsciousness" in pilots during flight, attributed to a combination of syncope producing factors. (Syncope is the medical term for sudden loss of conscious.) Dr. Miles recognized an analogy with the syncope hitting his divers. He completed some tests, confirming that one can indeed pass out if various influences, not so dangerous singly, are combined. Furthermore, breathing O<sub>2</sub> speeded the blackout. He

felt that O<sub>2</sub> might be the important common factor, and so suggested substituting the term "oxygen syncope" for "shallow water blackout."

Other authorities came up with different ideas. Some felt that hyperventilation, by lowering blood CO<sub>2</sub>, was the major cause. Doctors Lanphier and Schaefer, highly respected respiratory physiologists, suggested the opposite — that CO<sub>2</sub> retention was the villain. Dr. Dueker's 1970 volume, *Medical Aspects of Sport Diving*, omitted the term "shallow water blackout", and made no mention of unexplained syncope in scuba diving, but applied the name "underwater blackout" to the syncope befalling free divers. Confused, anyone?

It shouldn't really surprise us that in a sport as new as diving, and a science as new as dive physiology, there are gaps in our knowledge and in development of a uniform or official terminology. But the gaps slowly shrink, and we're now in a position to offer an outline which may simplify our thinking about why divers lose consciousness. It needs emphasis, though, that loss of conscious need not be complete to result in tragedy. Faintness, rendering a diver unable to cope, can have the same outcome. This outline may explain this more simply:

### UNDERWATER BLACKOUT (faintness or loss of consciousness underwater without apparent cause)

- I. Abnormal blood gas tensions.
  - A. CO<sub>2</sub> high.
    1. Exertion.
    2. Ventilation not adequate.
      - a. Equipment resistance and dead space.
      - b. Density of breathing gas.
      - c. Restrictive wet suit.
      - d. Skip breathing.
  - B. CO<sub>2</sub> low.
    1. Hyperventilation.
  - C. O<sub>2</sub> high.
    1. Compressed air.
    2. Mixed gas or pure O<sub>2</sub> in tank.
  - D. O<sub>2</sub> low.

1. Breath holding after hyperventilation.
- II. Heart output too low.
  - A. Heartbeat too slow.
    1. Diver's reflex.
    2. Carotid sinus reflex.
    3. Valsalva maneuver.
    4. Other reflexes.
  - B. Heartbeat too fast.
    1. Anxiety.
    2. Stimulants.
    3. Reflexes.
    4. Others.
  - C. Venous return reduced.
    1. Valsalva.
    2. Ascent while holding breath.
  - D. Relative inadequacy.
    1. Excess demand.
- III. Other factors.
  - A. Psychological.
  - B. Temporary physical states.
    1. Fatigue.
    2. Low blood sugar.
  - C. Illness.
  - D. Drugs.

If all this doesn't seem exactly simple, that's because it isn't. We'll run through the outline and try to clarify the concepts that are unfamiliar to many people.

The first and largest problem group involves CO<sub>2</sub> retention. Excess CO<sub>2</sub> makes the blood too acid, which disturbs body chemistry. It's also a potent narcotic. Its proper tension in arterial blood is 40 torr (millimeters of mercury); 60 torr is quite distressing, and 80 torr puts on near collapse. We generate CO<sub>2</sub> faster during exertion. Normally, any elevation stimulates special sensors, setting off reflexes that increase breathing, which blows off the excess. Yet a glance at the outline shows divers have found a few ways to keep their CO<sub>2</sub> above normal.

The first way is by breathing through regulators. Even the finest add resistance and dead space. The diver increases his respiratory effort so as to overcome these obstacles, but never completely. It's as though he finds a happy (or unhappy) medium between the penalty of extra breathing work and the penalty of CO<sub>2</sub> retention. (Continued on Page 84)



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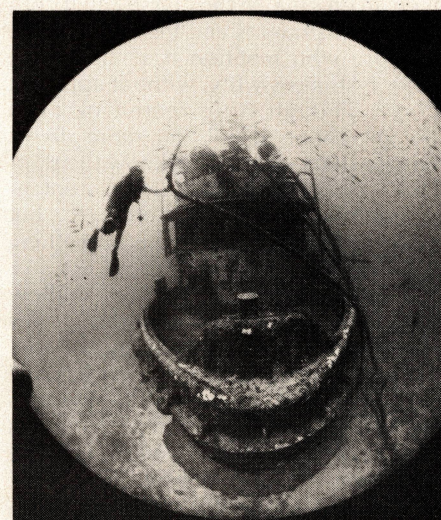
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## I Q8-

The Eighth International Conference on Underwater Education comes to San Diego, California, November 5 through 7, 1976. IQ8 brings together nearly 2000 divers, educators, equipment manufacturers and retailers, scientists, professional divers and individuals interested in diving. Sponsored by the National Association of Underwater Instructors, IQ has grown from a few hundred instructors in 1969 to become the biggest dive conference in the world.

This year's program will be both educational and entertaining. The Friday, Saturday and Sunday of IQ8 will be filled with over 50 technical presentations, 100 displays of dive equipment and services, a gala film festival, conference socials and an awards luncheon. Experts from every dive related field will present the most recent developments and achievements in diving.

A highlight of this year's program will



photograph by Rick Frehsee

be a very special presentation on Saturday afternoon by Bill Burrud, famous television personality and producer of many underwater, adventure and nature series. Burrud will relate the behind-the-scenes adventures which are a part of the production of a television series.

A first at this year's conference will be the availability of the *IQ8 Proceedings* at the conference. This special publication contains all the papers presented at IQ8. Use the *Proceedings* during the conference to pick the presentations you really want to hear. Take home a written record of the conference to review those papers you really enjoyed and read those you were unable to hear presented.

The entire Plaza Hall at the Convention and Performing Arts Center has been set aside to house the exhibits at IQ8. There will be over 50,000 square feet of



# U/W SHOW IN SAN DIEGO

exhibit space with more than 100 displays. Representatives of dive equipment manufacturers and retailers, instructional organizations, travel agencies and all facets of diving will be available to demonstrate and discuss the latest trends in dive equipment, its manufacture and use, travel holidays and vacations, instructional programs, and much more. In addition, the evening of November 4th has been set aside as a special exhibit time for retailers, store owners, managers, or buyers to meet and consult with equipment manufacturers.

On Friday night a Let's See Who's Here Party will be held in the exhibit area. This informal setting provides an opportunity to meet the leaders of the sport diving community socially and exchange your thoughts with theirs. Admission to the party and two drink tickets are included in the conference registration package.

At the awards luncheon on Saturday afternoon, NAUI will recognize those individuals who have worked with dedication and diligence to improve the sport of diving. During the ceremonies, hosted by Arthur Ullrich, former General Manager of NAUI, a special award, the Leonard Greenstone Diving Safety

Award, will be presented to an outstanding individual selected by the NAUI Board of Directors as contributing most significantly to the safety of sport diving.

Saturday evening will be a gala film festival organized and presented by Paul Tzimoulis, Editor and Publisher of SKIN DIVER Magazine. Paul will screen for your enjoyment the newest and best films available. A ticket to the film festival is included with the conference registration package. Additional tickets are available for guests.

Small meeting rooms are available free for dive groups to use. Meetings of women instructors, instructor course reunions, course directors and others have already been planned. To reserve a room for your meeting, contact NAUI Headquarters.

In addition to all this, over \$2000 in door prizes will be given away during IQ8. Prizes include trips, books, scholarships and dive equipment. Special family activities are also available to keep everyone entertained during IQ8.

When the conference officially ends on Sunday afternoon, more fun begins. Local dive trips are planned to San Clemente Island, Cortez Banks, and all

the California Channel Islands. There are also reduced rates on post-conference holidays in Hawaii, Micronesia, Fiji, Galapagos, Cozumel, Cabo San Lucas, Honduras and Haiti.

IQ8 will be held at the Convention and Performing Arts Center in downtown San Diego. The Royal Inn at the Wharf will serve as the main conference hotel. Special travel fares to San Diego, reduced rates at the Royal Inn, rental car discounts, shuttle bus service and much more are available to attendees.

Complete Conference Registration: \$45 includes admission to all sessions, film festival, social and drink tickets, exhibit admission, eligibility for drawings, awards luncheon and a copy of the *IQ8 Proceedings*. (After October 15th, this package costs \$55.)

Conference Registration Only: \$24 includes admission to all sessions, film festival, social and drink tickets, exhibit admission, eligibility for drawings. (After October 15th, this package costs \$29.)

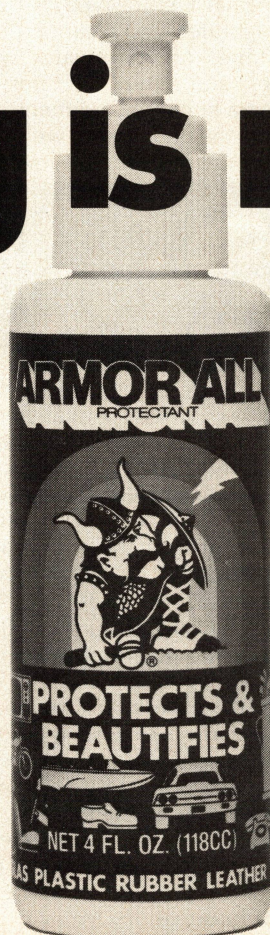
Additional tickets for any event or the *Proceedings* may be purchased in advance at a savings. For IQ8 Registration and Information contact: IQ8, P.O. Box 630, Colton, CA 92324.

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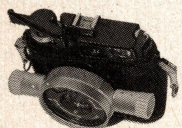


For growing number of Octopus Regulator users, we provide Hose Holders and Hose Guards in bright red Dayglow — which remains bright even in great depth and poor visibility. Distinctive color allows the anxious diver to identify the extra second stage regulator. Kit price (1 Hose holder and 2 Hose Guards): \$8 50, plus 75 cents ship & handl.

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#### LENS CONTROL EXTENDERS

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Bring the lens control knobs of the Nikonos camera out to where they are easier to get at. Oversized knobs are ribbed for easy gripping — and etched for writing lens setting. \$6 per set. Plus 50 cents shipping and handl.



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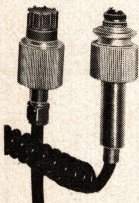
Designed for Sekonic Marine Meter II. Securely locked into Mounting Bracket with 2 threaded rings, can be removed without tools. Bracket has threaded fittings on back and bottom, allowing it to be mounted on top or side of a camera housing. Bracket can be removed easily from Handle for mounting on a camera or Nikonos handle. Complete Unit—Mounting Bracket, Handle & Eye Bolt #41HC2—\$19.95. Plus 75 cents shipping & handling. Mounting Bracket Only #41HC32 \$12.95. Plus 75 cents shipping & handling.



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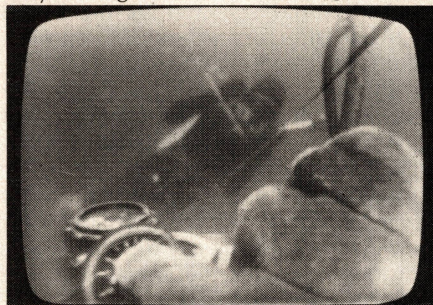
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DEALER INQUIRIES INVITED

## TV Cameras Aid Diver Education

The effective use of a helmet mounted television camera in the training of underwater divers is part of a master's study in physical education recently conducted by Steven Barsky, a Santa Barbara City College marine technology major.



A diver's gloved hand is visible in the foreground of this off the television screen picture of a diver using the helmet mounted camera. Second diver (background) also observes hands-free operation.

The various tests that were conducted at the Santa Barbara City College's Marine Technology facilities, proved the overall effectiveness of diver training and performance through the use of television, according to Barsky.

The variety of tasks evaluated were identical to the jobs working divers are called upon to perform daily at sea. The equipment is also that used on the commercial offshore industry.

Three test groups were used. One received normal lecture type instruction; another, lectures and "canned" video training tapes of underwater welding techniques; and a third, lectures, tapes, and the extra benefit of augmented feedback during the underwater welding task from one of the marine tech instructors.



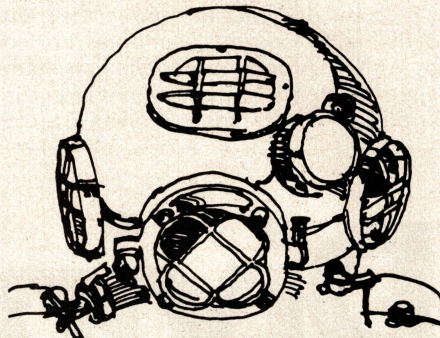
A specially designed diver's helmet, produced by General Aquadyne, Inc., which included a sealed black and white Vidicon television camera mounted above the diver's faceplate, was used in the study. An audio system provided communication from the underwater site to topside where the tests were viewed on television and recorded on video tape.

A lighting system, included in the helmet, illuminates the underwater work site, and provides lighting for the TV eye and a hands free work area for the diver.

Barsky is now using such Aquadyne equipment as an offshore oil inspector on a North Sea project for Subsea International based in Scotland.

From an analysis standpoint, the use of video tape for data collection and review was found to provide a tremendous amount of information.

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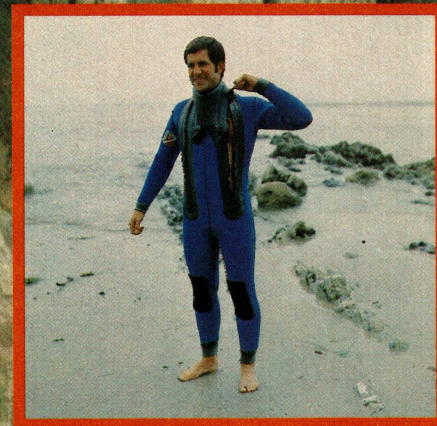
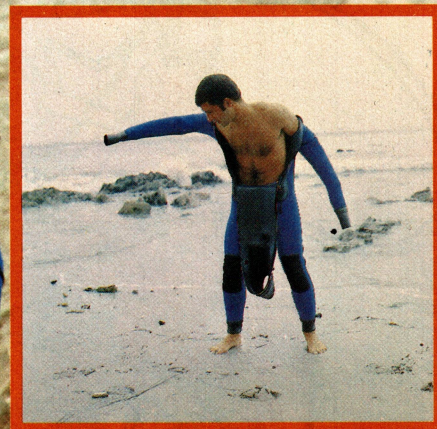


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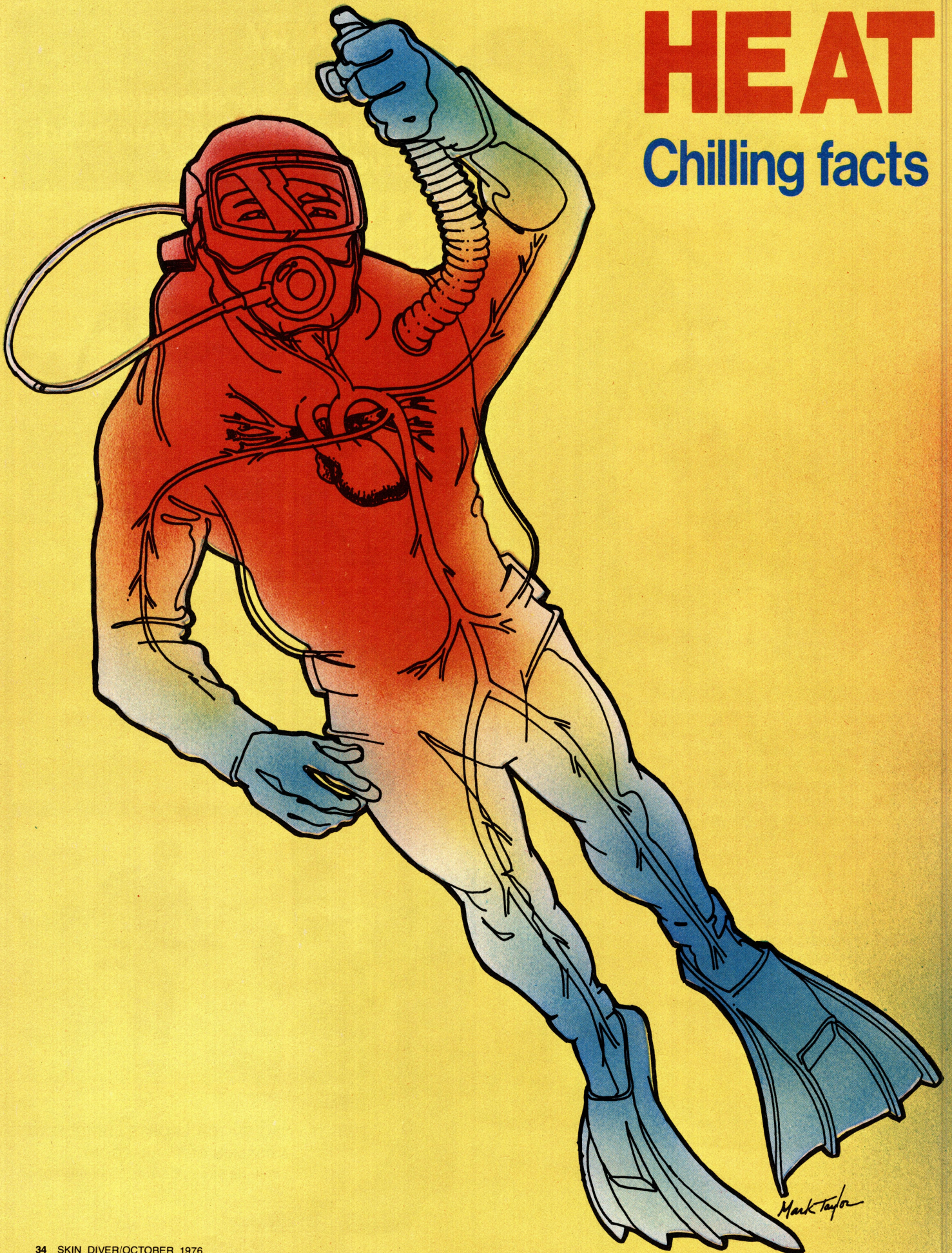
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# HEAT

Chilling facts





# LOSS IN DIVERS

## on cold water exposure

By Captain Wm. H. Spaur

In addition to decompression considerations, thermal problems arising from exposure to cold water pose a major consideration in dive planning and a major hazard for divers. In fact, being uncomfortably chilled at the end of a dive has almost become an accepted condition for divers. Knowledge of the characteristics and the quantity of heat loss may be as important as the consideration of the decompression tables. A repeat dive without complete rewarming could have serious dangers, just as repeat dives have had on previously absorbed inert gases that have not been given off during the surface interval.

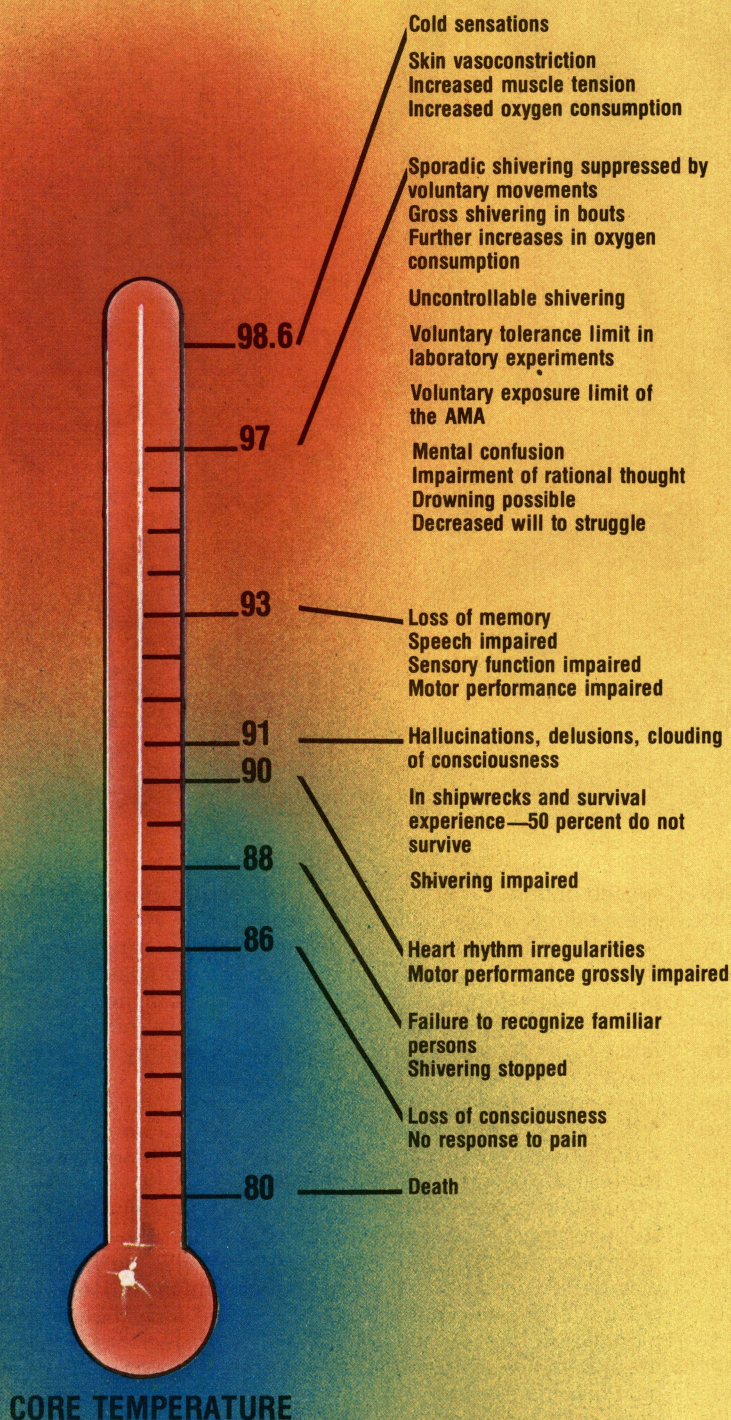
### Cold Water Exposure

The rate of body heat loss in water is many times greater than in air because of the difference in the specific heat of water and air and the thermal conductivity of water. An unprotected diver experiences the same heat loss while diving in 80°F water as he would standing unclothed in 42°F air. Few would go outside in a bathing suit when the temperature was 42°F, yet divers consider 80°F water very comfortable. A water temperature of 92°F is required to keep a resting man at a stable temperature, neither gaining nor losing heat.

The ability of the body to tolerate cold environments is due to natural insulation and the body's built-in means of heat regulation. Usually, the body temperature is thought of as being 98.6°F, but in fact the temperature is not uniform throughout the body. It is more accurate to consider the body with an inner core, where a constant or uniform temperature prevails, and a superficial region, through which a gradient exists from the core temperature to the body surface. Over the trunk of the body, the thickness of the superficial layer may be approximately one inch. The extremities become a superficial insulating layer when their blood flow is reduced to protect the core.

Maintenance of core temperature within fairly close limits is important in the maintenance of normal organ function especially in regard to the heart and brain. The simplest way to consider the temperature system is to think of the human body as having a certain amount of stored heat with gains and losses of heat added or subtracted. The temperature of the core will remain constant when the gains and losses are equal.

Changes in this stored body heat are made primarily through three mechanisms. First, there is a relatively small and constant basal metabolism to which the heat production associated with physical exercise or shivering is added. Severe exercise may increase heat production 20 times the basal level. Shivering is a special form of muscular activity aiding the body in maintaining its core temperature during exposure to cold; at its maximum, it may produce approximately five times the heat of the basal metabolism. The second factor affecting the body's core temperature is heat loss to the environment, which occurs by radiation, conduction,







and convection, methods by which any warm object loses heat to its cooler environment. The third method is heat lost through evaporation from the skin and the evaporation of water to moisturize the air drawn into the lungs.

The insulation between the body core and the environment normally involves three components for a diver. The first is the surface layer of the body. The built-in insulation of the body depends largely on subcutaneous fat. When the limbs are under physiological control protecting the body from heat loss, the length of the limbs insulates the extremities from the core. The second element is a layer of air (inflatable dive suits) or water (wet suits) that is trapped on the surface of the skin. The third component is a layer of clothing, which may be thermal underwear or foamed neoprene. Nearly all practical forms of external insulation depend upon air which, with its low specific heat and heat capacity, approaches the ideal provided it is immobilized. Thus, the physiological function of protective clothing or suits is to trap and immobilize air both in the fabric and between its layers. The temperature gradient from the diver's skin to his protective clothing may be diminished or even made positive by heating. Electrically

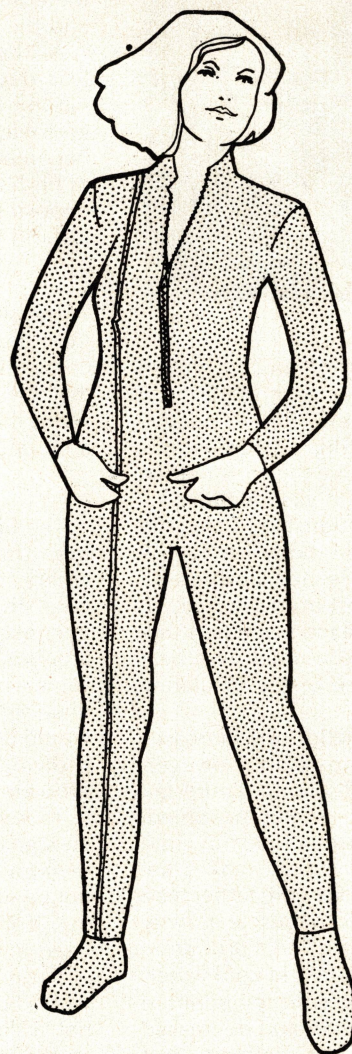
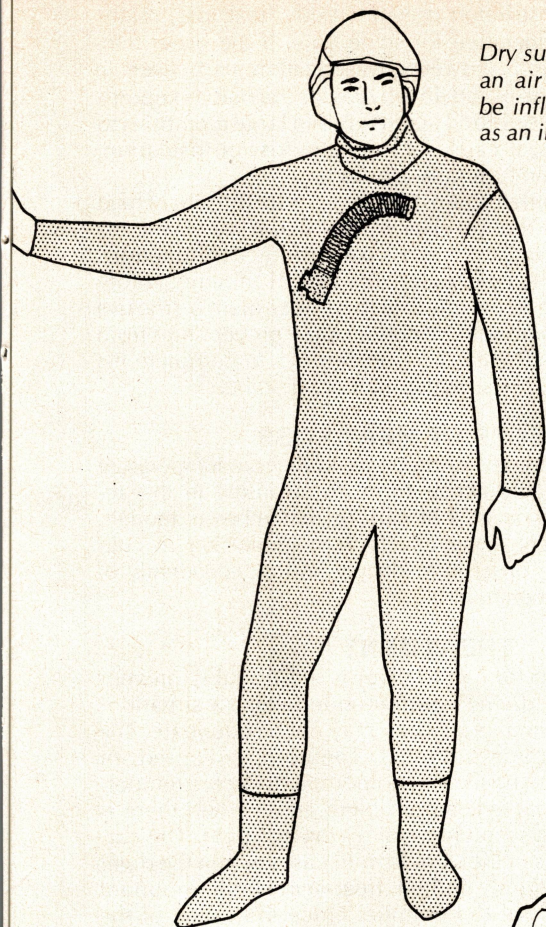
heated underwear or circulation of hot water through the suit are methods of adding heat to the diver.

Once in the water, man becomes largely dependent on internal mechanisms to limit the loss of body heat if no supplemental heating is provided. Any variations in the effectiveness of these mechanisms, which would be of minor importance in air, lead to great differences in the ability of different people to maintain heat balance in water.

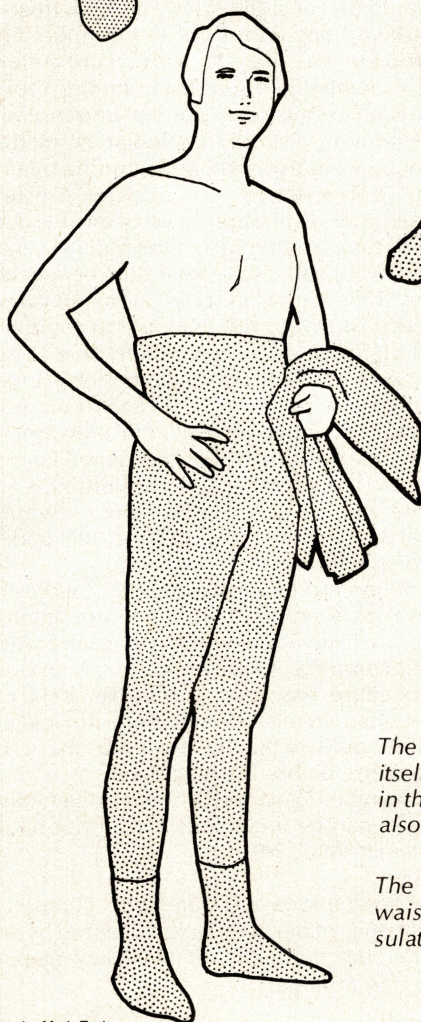
Heat loss through the superficial layer is lessened by the reduction of the blood flow in the skin. This automatic, cold induced vasoconstriction (narrowing of the blood vessels) lowers the heat conductance of the superficial layer and acts to maintain the heat of the body core. Unfortunately, vasoconstrictive regulation of heat loss has only a narrow range of protection. When the extremities are initially put into cold water, the usual vasoconstriction occurs and the blood flow is cut off to preserve body heat. After some time though, the blood flow increases and fluctuates up and down for as long as the extremities are in cold water. As vessel dilation occurs and heat loss increases, the body temperature falls and may continue falling even though heat production is increased by



*Dry suits have rubber seals around the neck, wrists, and ankles forming an air tight seal. The chest mounted inflator hose allows the suit to be inflated for buoyancy purposes. Unlike wet suits, dry suit traps air as an insulating property instead of water between body and neoprene.*

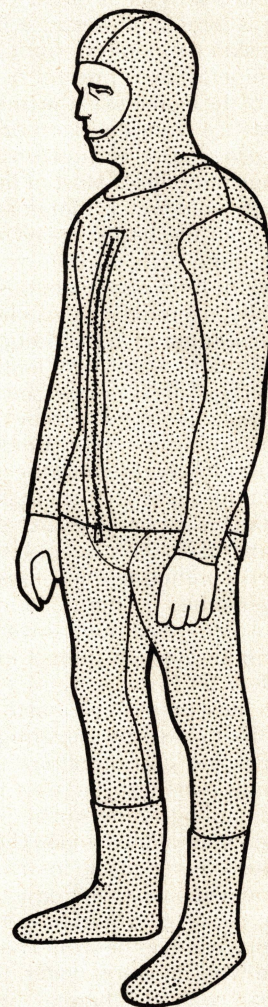


*The one piece suit is designed for warmth and comfort. There are no layers where water can seep in. With rolled edges and booties, the one piece suit is a great suit for moderately tempered waters.*



*The two piece suit with hooded jacket has hood connected to the jacket itself. This feature cuts down on amount of water allowed to circulate in the neck and chest area. The inverted zipper placed about midchest also helps cut down water circulation and allows ease of suiting up.*

*The standard two piece suit consists of a pair of pants with a high waistline and a jacket with a zipper up the front. This provides more insulation to trunk area of the body to help maintain core temperature.*







shivering. This effect, called cold vasodilation, occurs only in water colder than 50°F and appears to be caused primarily by direct cold paralysis of blood vessels in the skin. Protective clothing is beneficial because its insulating properties may keep the skin temperature sufficiently above the surrounding water temperature to prevent or delay cold vasodilation.

Much of the heat loss in the trunk area is transferred over the short distance from the deep organs to the body surface by simple physical conduction, which is not under any physiological control. Most of the heat lost from the body in moderately cold water, therefore, takes place from the trunk and not from the limbs. Heavyside men lose much less heat from the trunk than do thin men because of the insulating properties of thick subcutaneous fat.

Normally, exercise increases heat production and increases body temperature in dry conditions. Paradoxically, however, exercise in cold water may make the body temperature fall more rapidly. This is not caused by just the water movement around the subjects, but also by the increased blood flow into the limbs during exercise. Continual movement makes the limbs more closely resemble the internal body core rather than the insulating superficial shell. Shivering is a muscle activity that in effect is similar to exercise; it increases heat production but also increases the susceptibility to heat loss in cold water. These two conflicting effects result in the core temperature being maintained or increased in warm water and decreased in cold water. Maximum shivering will just maintain heat balance in an average subject in a water temperature of approximately 60°F.

A diver must understand that to increase his heat production three or four times by shivering requires an equivalent increase in oxygen consumption. Further, the minute ventilation of the lungs must also increase by the same magnitude. If a diver is breathing 12 liters of air per minute at rest in the water and he becomes chilled and his heat production must increase three times to compensate for his chilling, then his respiratory ventilation will have to increase to 36 liters per minute. In this example, the diver would have the same air consumption at rest keeping warm as he would have had if he were performing moderate work in warm water.

If a man with no thermal protection at all is suddenly plunged into very cold water the effects are immediate and rapidly disabling. There is a sudden inspiratory movement followed by a period of increasing respiratory rate and an increasing tidal volume. The breathing is rapid, with breathing control involuntary, so the swimmer cannot coordinate his breathing and swimming movements. This lack of breathing control makes survival in rough, cold water very unlikely. In freezing water, collapse from exhaustion occurs within one to fifteen minutes, depending somewhat on the fatness of the swimmer.

If the water is not too cold, or if the diver has some thermal

protection, vasoconstriction prevents body heat loss, maintaining the core temperature for some time. If the water temperature is below 50°F, however, vasodilation starts even in heavyside men, and the blood flow bypasses the body's superficial insulating shell. As blood again flows in large quantities to the cold extremities, it causes a dramatic loss of insulation, and the body temperature falls rapidly.

All these factors weigh against the diver, with the rate of heat loss depending on the severity of his exposure. Even his natural insulation and the body's own protective functions give way to especially cold water. The diver's thinking ability becomes impaired, and the effect of this impairment on the use of his hands and other motor functions may prevent him from choosing and executing the best procedures to complete his task. In some cases, his survival may be at stake.

## EFFECTS OF HEAT LOSS

The signs and symptoms of dropping body core temperature from the first noticeable effects to death are listed in the accompanying chart on page 34. It must be remembered, though, that there are sudden, acute effects from immersion in cold water that have their onset immediately and independently of a dropping core temperature.

## TREATMENT

The best treatment for a cold diver is indisputably preventive. Unfortunately, diving is often undertaken in situations where adequate thermal protection may not be adequate. The cold diver may become irrational, confused, collapsed, or unconscious. The diagnosis of hypothermia (low core temperature) is easy if suspected; the problem arises when there is some accompanying suspicion of a diving accident. The cardinal sign is coldness of the skin. In mild cases, when the diver would be considered only chilled, treatment is still important if diving operations are to continue. Since the cause of the problem is a fall in the body's core temperature, the treatment is to reheat. People with immersion hypothermia severe enough to cause confusion or unconsciousness may die unless rewarming is started immediately; medical assistance should not be waited for before beginning treatment. Active rewarming, if it is started soon enough, can revive a person whose heart and respiration have been stopped by hypothermia.

The most efficient and the quickest way to reheat a diver is with a hot bath at a temperature between 104° and 111°F, or as hot as the hand can stand. In severe cases of hypothermia, the speed of rewarming is important and a hot bath is the only efficient way. The next alternative is to dry the subject and provide him with warm clothes or blankets and a warm room.

In cases involving confusion or more severe symptoms, the treatment of hypothermia must reheat the core as quickly as possible because of a phenomenon known as the "after drop." As the man is reheated, cold blood is shunted into the body core and the core temperature continues to drop during the first ten minutes or so. Thus, the patient may, initially get worse before recovering fully.

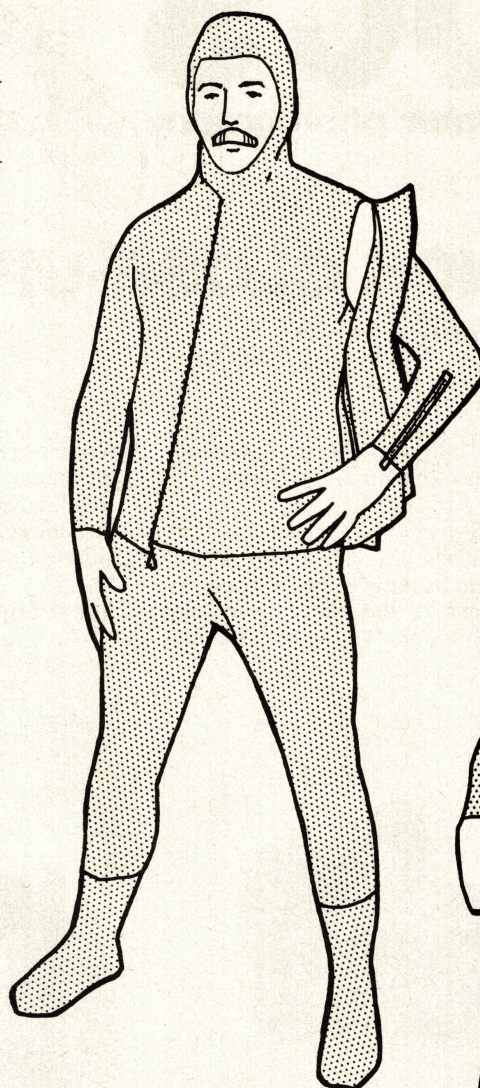
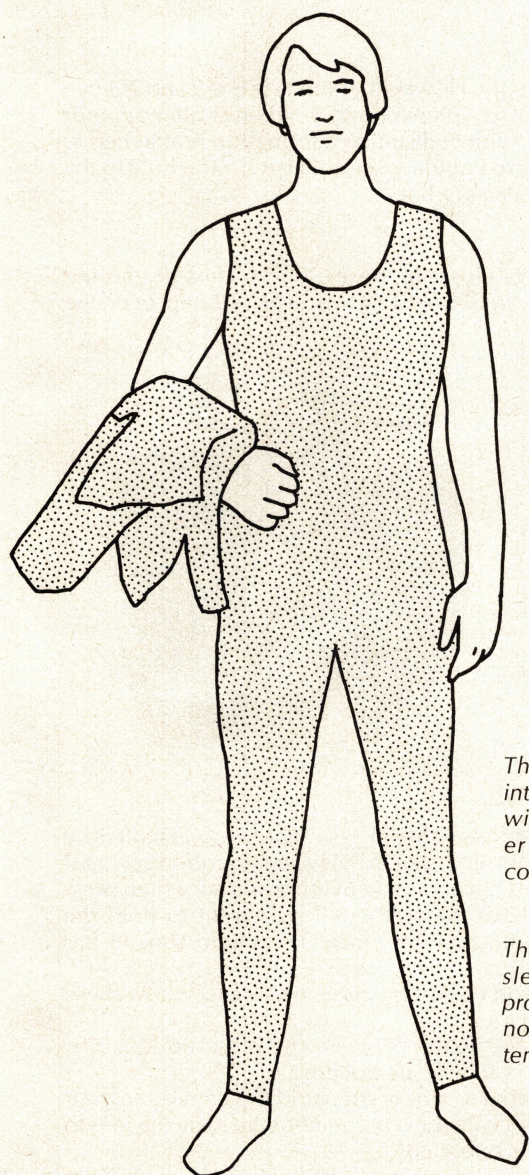
When is reheating complete? Studies have shown that men invariably reported feeling warm again very soon after they stopped shivering, when rewarming was apparently less than half complete. There is one simple indicator that a rewarming procedure has been carried on long enough: the onset of sweating. In repetitive diving with cold exposure, perhaps the rule should be that the diver must be rewarmed to the point of sweating before his next dive.

No matter how well trained a diver may be, exposure to cold water can be hazardous and, if not treated quickly and adequately, fatal.

*The opinions and statements contained herein are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the Naval service at large.*

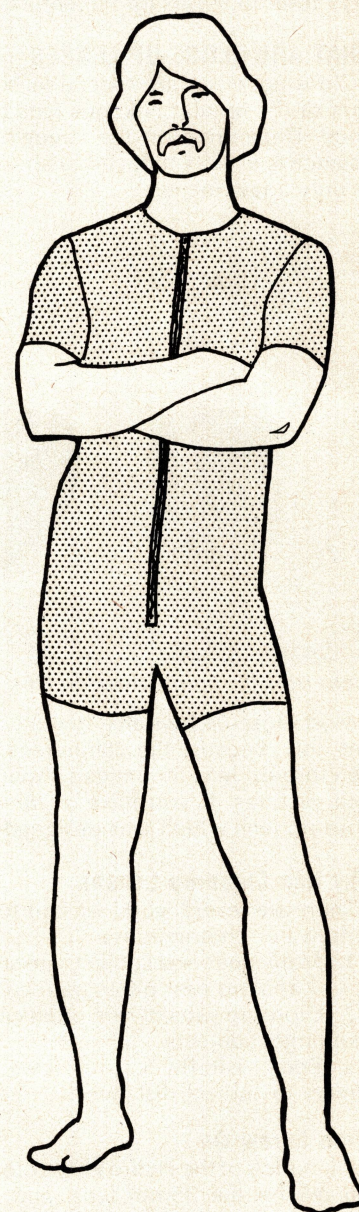


*The three piece suit usually consists of a pair of pants, hooded vest, and a jacket. This combination has the same advantages as the jacket with an attached hood plus giving the added warmth of two layers of neoprene around the trunk area.*



*The farmer john is a style of pants that develop into a farmer john meeting at the top, usually with Velcro fasteners on each shoulder. Farmer john paired with a jacket gives double coverage and insulation around trunk area.*

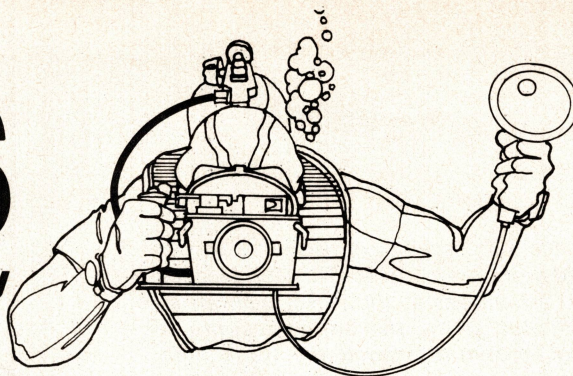
*The shortie suit usually has short legs, short sleeves, and a front zipper. This provides protection for the trunk area in water that is not quite warm enough to sustain an even core temperature without losing or gaining heat.*





# abc's

of underwater photography



## CHAPTER 10

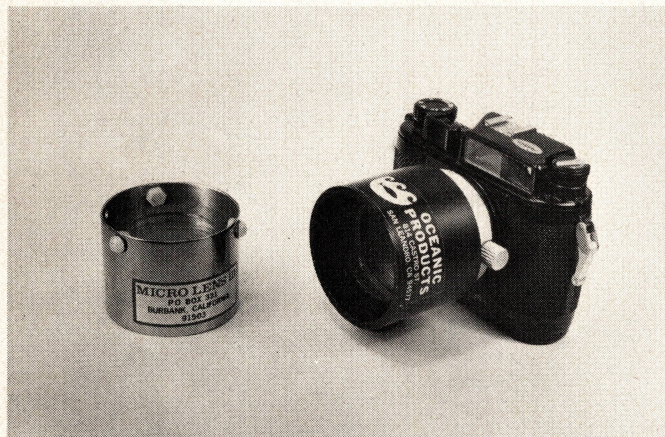
# NIKONOS CLOSE-UP LENSES

By Jim and Cathy Church

The purpose of this chapter is to introduce you to supplementary close-up lenses for Nikonos close-up photography.

### WHAT ARE CLOSE-UP LENSES

Close-up lenses are special lenses which can be placed in front of the regular Nikonos lens to reduce the focused distance. Depending on the strength of the lens, the focused distance is usually reduced to about one or two feet, but may be only a few inches.



Micro Lens III slip on close-up lens.

Most close-up lens attachments are for the Nikonos 35mm lens only. Because the 28mm lens has a wider picture angle, the close-up lens mount can show up as rounded corners in your pictures. If you have a 28mm lens, be sure to buy a close-up lens which was designed to be used with it.

### Why Use Close-up Lenses

There are several good reasons for using close-up lenses for underwater photography:

1. Many undersea subjects are small — starfish, anemones, etc. — and are best photographed at close distances.
2. Close-up subjects are often easier to find and illuminate than larger subjects.
3. Poor visibility causes fewer problems at the closer camera-to-subject distances.

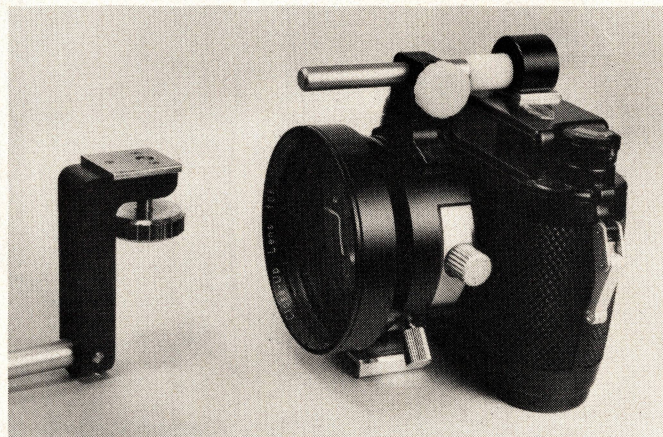
### Some Screw On

All models of the Hydro Photo close-up lenses — the #1, #2 and #3 for the 35mm lens, and the 12-28 for the 28mm lens — screw directly into the accessory threads of the

Nikonos lens assembly. However, models #1, #2 and #3 can be special ordered for a press fit into a Nikonos filter adaptor ring. Focusing and subject distance information is attached to the sides of the Hydro Photo lenses, and each has a hole in the side for attaching a safety line.

### Some Slip Over

The Green Things close-up lenses, Micro Lens III and the Oceanic Products Nikonos Close-up Lens, all slip over the



Nikonos close-up lens.

Nikonos 35mm lens assembly. These lenses are installed by gently pressing them into place. The Oceanic Products and Green Things lenses have a single nylon setscrew which presses against the side of the Nikonos lens mount to hold the close-up attachment snugly in place. The Micro Lens III has three such screws.

When using slip on close-up lenses, be sure to follow these recommendations:

1. Be sure that the space between the close-up lens and Nikonos lens port is free of air bubbles.
2. When swimming to a new site, hold the camera so your fingers are in contact with the lens, and be sure to tie the lens to your camera with a safety cord.
3. Before taking a picture, press the lens firmly against the camera to be sure that it is properly aligned.

### The Nikon Close-up Outfit

The Nikon close-up lens system can be used with the Nikonos 28mm, 35mm and 80mm lenses underwater, and with the 35mm and 80mm lenses in air.



The close-up lens mount slips over the Nikonos lens assembly and is held in place by a finger tightened screw adjustment on the side of the close-up lens mount. This screw doesn't directly press against the side of the Nikonos lens assembly — it tightens a band running around the inside of the close-up lens mount so the pressure is evenly distributed. In addition, a supporting rod attaches to both the accessory shoe of the camera body and to the close-up lens mount for support.

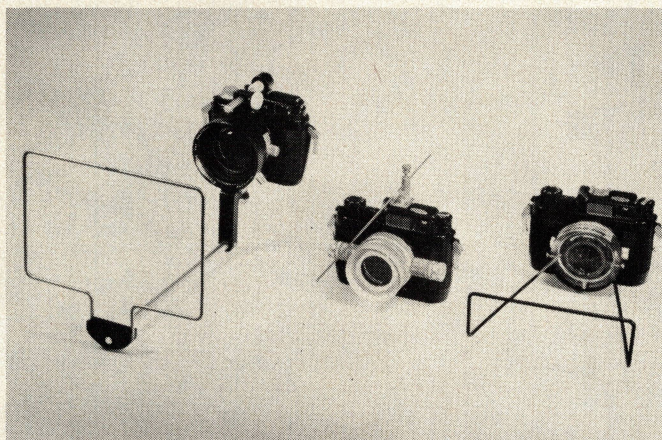
Slits at the top and bottom of the close-up lens mount automatically flood the space between the close-up lens and the Nikonos lens port, but visually check for bubbles adhering to the glass surfaces.

The lens, a detachable bracket and a set of framers, and a detachable swivel bracket for attaching the Nikonos BC Flashbulb unit are all packaged in a carrying case with cutout pockets in the foam interior for each of the component parts of the Nikon Close-up Outfit.

### Aiming the Camera

Because the Nikonos clip on sportsfinder and the built-in optical viewfinder are not functional at close-up distances, other methods of aiming the camera must be used:

1. The Nikon Close-up Outfit has a detachable bracket and a set of three framers. The framer you select depends on which lens you are using, and if you are working in air or water. The framer shown in our illustration (below) is for the 35mm lens. The 28mm lens framer covers a larger area, and the 80mm lens framer a smaller area.



Various kinds of framers may be used.

2. Hydro Photo (right) furnishes an adjustable wand for their #1, #2 and #3 close-up lenses, and a framer for the 12-28 lens. Their brochure provides detailed instructions on how to use these aiming devices.

3. Some Green Things (above) lenses have framers which indicate the top half of the picture area (or bottom half if you turn the lens over.)

4. Both Oceanic Products and Micro Lens III are develop-

ing framing devices at this writing. However, you can learn to aim by eye alone. While this may seem awkward at first, you'd be surprised how accurately you can eyeball it with practice.

### Practice Aiming

With a new close-up lens, practice aiming it in a swimming pool. Choose a bright day and use Tri-X (ASA 400) so you can expose with sunlight. Use any small objects for subjects — shells, toy cars, etc. Have the film developed only — you do not need prints! Simply look at the negatives to see if you aimed correctly.

### Exposure Testing

With color film, you almost always need flashbulbs or strobe lighting to gain color and depth of field. Before taking a new lens on an expensive dive trip, take a series of test exposures on color slide film to find the best aperture and strobe-to-subject distance for pleasing exposures.

### For More Information

For more detailed information about the close-up lenses discussed in this article, you can write directly as follows:

1. For Green Things lenses, send one dollar to Aqua-Craft, 3280 Kurtz Street, San Diego, CA 92110, for their catalog.
2. Write to Hydro Photo, 3909 13th Avenue South, Seattle, WA 98108 for a free brochure.



Hydro Photo #2 screw on close-up lens.

3. Write to Micro Lens III, P.O. Box 331, Burbank, CA 91503, for a free brochure.

4. Write to the Consumer Relations Department, Ehrenreich Photo-Optical Industries, Inc., 623 Stewart Avenue, Garden City, New York 11530, for information about Nikonos lenses.

5. Send \$1.25 to Oceanic Products, 814 Castro Street, San Leandro, CA 94577, for their catalog.

### Photo Quiz

1. Can close-up lenses for the Nikonos camera usually be removed or installed while you are underwater?
2. Is it usually best to use sunlight for color close-up exposures?
3. Is it always necessary to use a wand or framer to aim the camera for close-up photography?

NOTE: Neither Jim and Cathy, or SDM, can critique your work. Answers to the above: (1) yes, (2) no — use flashbulbs or strobe, (3) no.

### Assignment

The following assignments can be performed in a pool with shells, toys or other objects for subjects:

1. Using Tri-X, and sunlight exposures, expose a roll of film to practice aiming the camera and close-up lens.
2. Using color slide film, and flashbulbs or strobe, make a series of exposure tests to determine your optimum aperture and strobe-to-subject distance.
3. Photograph a subject(s) from several camera angles to study the effects of angle and depth of field.



## The Freckled Hawkfish

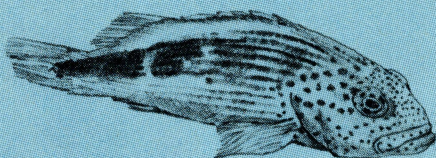
(*Paracirrhites forsteri*)

Of all the hawkfishes found in the Indo-Pacific, perhaps the most wildly colored is the freckled hawkfish. Each individual of the species has two color patterns — at the same time. The front half of the fish is distinctly spotted and the rear half is distinctly banded. The paracirrhitidae are members of the cirrhitidae family of hawkfishes. Para means “near,” and the sub-grouping is because of a few notable differences: the paracirrhitids lack palatine teeth and have large scales on the cheek. The paracirrhitids also have color patterns, and *P. forsteri* is probably the wildest of them all in this regard.

□ Normally the color pattern of the freckled hawkfish will consist of an olivaceous head that is spotted with red and black spots. Along the base of the dorsal fin is a white streak, underneath that a long black blotch, and beneath that a broad whitish band. The lower half of the side is marked by about seven horizontal orange-yellow stripes. The iris of the eye is red. On some individuals these markings may be less distinct, but the combination of the bands and the spots is always evident. □ The freckled hawkfish is one of the most common of the hawkfishes and is found in numerous areas of the Indo-Pacific. It is distributed from the Red Sea, Zanzibar and Mauritius eastward through the East Indies and Polynesia as far

as the Hawaiian Islands. Ichthyologists Gosline and Brock have observed that this fish seems to be restricted to deeper waters than other hawkfish species that occur in the same range. The freckled hawkfish is a small species, reaching a total length of four to eight inches. □ The common name hawkfish is derived from the predatory bird, since both animals have a similar method of hunting their prey. The freckled hawkfish will perch itself up on its strongly developed pectoral fins, atop a branch of coral, and wait. When it sees its meal it will

make a quick dash for it, and return to its coral branch at the finish. The diet of the fish is comprised primarily of small fishes and crustaceans, notably crabs. □ Hawkfishes are shy and a diver will not very often see them out in the open. They stay, for the most part, concealed amid coral



adult species

branches, darting out only to nab some unsuspecting prey. Because of this attachment to its coral refuge, the hawkfish is called pilikoa, or “coral-clinging,” in Hawaii. The freckled hawkfish is called hilupilikoa. Hawkfishes have been captured by the removal of an entire chunk of coral, which it will stay with even when it is removed from the water. When hawkfishes are kept in aquariums, they should be provided clumps of coral in which they can hide. ➤

*Photo By Paul Tzimoulis - Text By Hillary Hauser*

Photo taken in 20 feet of water off the Kona Coast in Hawaii. Tzimoulis used a Nikon F camera and a 55mm Micro Nikkor lens in an Oceanic Hydro 35 housing with Ektachrome X film shot at f16 with a strobe flash.







# PHOTO CLASS IN PARADISE



By Nancy Furguson

**T**ake eight eager amateur photographers, add one expert instructor, mix well with sea water for five days and you end up with a hilarious, delightful, productive vacation which no one outside the dive community would ever understand or even believe.

The Kona Coast furnished the setting, See and Sea Travel the arrangements and our beloved ocean the subject matter for an adventure into U/W photography, a course conducted by Paul Tzimoulis.

We arrived in Hawaii total strangers early in November with only two things in common: diving and mountains of camera gear — most of it only vaguely familiar. We came from such diverse places as Canada, Georgia and the west coast of California. And within a few hours we were united in a common purpose: to learn as fast and as thoroughly as possible anything relating to underwater photography that our guru could teach.

Deplaning in Kona, meeting our companions, transporting luggage and dive bags to the hotel takes forever but was enjoyable because of the soft, sweet air and friendly attitude of the *Havaiki* personnel who would be our skipper, crew, helpers, guides, chefs and transportation for the next few days.

The Kona Surf is a comfortable and beautifully situated hotel on the water's edge, perched on a lava bed and magnificently landscaped with fascinating Polynesian artifacts scattered here and there and hand woven hangings on the walls. As we drove up, land tourists stared at our group with amazement since, even pretending that the luggage was divided evenly between us, Paul's 12 cases, which is a rough average for him to carry on each of his numerous dive trips, we still looked as though we had just immigrated.

A quick change from travel apparel

and we met for the traditional welcoming party at the dive shop to get acquainted, enjoy our first lecture and plan the following day. When we left, stuffed with great hamburgers and inspired by the slides we had just seen we all knew in our hearts that each of us would produce no less than 72 prize winning slides each day of our stay. We were in for a shock.

The morning of the first day was called "getting it together." It wasn't easy. There was never before, I'm sure, such a motley assortment of equipment — it must have caused Paul great consternation for he groaned when he realized what a harrowing time was approaching. But we did get it together and not too far off schedule. The *Havaiki*, a 50-foot catamaran put out to sea with all hands aboard. We spent a lot of travel time on the foredeck trampoline either sunning or just being lazy as we rode the swells, all the students were anxious and eager to use the secrets we had just learned to begin our initiation into the world of the underwater photographer.

We anchored in Kealakekua Bay, not far from Cook's Monument. With a "free" assignment — a place to start — everyone went over the side into about 30 feet of not quite crystal clear water, in what to me is still, after six years of diving, a new and wondrous fairyland. Butterflies darted about madly at our invasion, moorish idols glided past haughtily and trumpetfish coasted shyly behind fingers of coral, their hummingbird fins a blur of faint color. Suddenly, I forgot how to use my Nikons. What f stop? What shutter speed? How far away am I? I was struck with stage fright and all that wonderful confidence was draining into the Pacific Ocean. Bubbles rose from all directions as we frantically struggled to get into position for that perfect shot; flashes brightened the already brilliant water

and divers passed each other with slight waves of their hands to indicate recognition and joy.

The joy didn't last long. When we met again the next morning, the rolls of film turned in the first afternoon brought moans of disillusionment. The only cheerful person in the room was Paul Tzimoulis who just laughed and said, "You mustn't take it too seriously." Well, Paul, that's easy for you to say!

Riding the *Havaiki* out to sea again after a detailed lecture on close-up photography, the first of a continuous stream of repairs began. Cameras were taken apart, strobes adjusted, brackets changed, lenses borrowed, merriment bubbled over and everyone began to feel hopeful again as our leader calmly got us into a semblance of order. Skipper Nick had fish food and for most of us the day's first roll of film was exposed as he hand fed the tamest moray eel I've ever seen. Our second roll was shot on other close-ups with several of the class members using 28 or 21 mm lenses for the first time, an exciting new experience. On this dive as on the preceding three, no one needed to go below 50 feet so we all had great bottom time. We had learned to stop chasing fish, to be patient and wait for them, to look more carefully around us, and to work in pairs with our buddy to get the best results. It was hard to leave the water for the ride back, dinner and some time with the mantas who are fed each day in a spot below one of the Kona Surf's terraces.

Time was galloping by. The evenings were sleepy time — making it a problem to stay up as late as we wanted, though most of us held out till the last possible moment and ended up short on sleep. It didn't seem to matter very much. We absorbed another lecture and slide show. And in spite of the fact that Paul



chose this strategic moment to reveal that the slides were his seconds, for some strange reason our confidence was again high, perhaps because there was no film delivery on the third morning.

Using available light underwater has always spooked me. That, of course, is because I had no idea how to use it. Now, armed with the morning's information, my buddy and I did flips and somersaults for each other at The Arches where, with bright sun overhead, there was a good chance for some silhouette shots. By the time we bracketed each shot, it didn't take long to use a roll of film; the rest of our tank air we spent looking around — for the fish life was plentiful and varied and the arches and coral were beautiful.

Each time a diver came up a crew member was there to help take off gear, wash cameras in fresh water, serve food and drink and always have a cheerful smile. Even the disaster of a flooded camera was lightened by the good spirits, willing hands and knowledgeable assistance shared with us so generously. One of the crew members, Kristy, flew her kite as we headed back to shore. I felt as if I were flying with it as it streamed out behind the *Havaiki*.

This third day of the brief trip which was slipping away from us ended in a blaze of glory when Dewey Bergman from See & Sea arrived for a few days' stay, bringing with him movies for the film festival that just ended in Honolulu.

Day four was planned around a night dive; it therefore began later in the day than our usual 7:30 a.m. The group scattered for shopping, sunning or whatever in the morning and met again for the lecture which was, this time, on working with flash. Some films had been returned for all of us and for the first time the laughter was optimistic instead of rueful. We were actually taking pictures. Yes, there were under- and overexposures, tail shots and stray fin corners showing. But there were also some recognizable moray eels, some well composed sea urchins and a few whole fishes in the frames. We were excited.

It was a treat to dive with Dewey and his charming wife, Inez. They looked around, apparently enjoying themselves as much as the rest of us. We had returned with pleasure to our friendly eel in Kealahou Bay, only to discover that he had a house guest — now we were intrigued by the task of taking a picture with both eels in one frame, a problem well within the assignment for the day.

With my borrowed framer I couldn't get in between the coral fingers for a

(Continued on Page 88)



photography by Paul Tzimoulis

*The 50-foot sailing catamaran Havaiki became classroom for eight eager amateur photographers and their instructor. The Kona Coast, Hawaii surpassed their expectations for underwater scenery to practice their newly learned skills.*



*Above, all the students and their camera equipment gather together to pose for what must be one of the most unusual class portraits ever taken. Below, class members gather around to inspect the beautiful sea snake and practice their newly learned techniques in close-up photography, but not too close!*

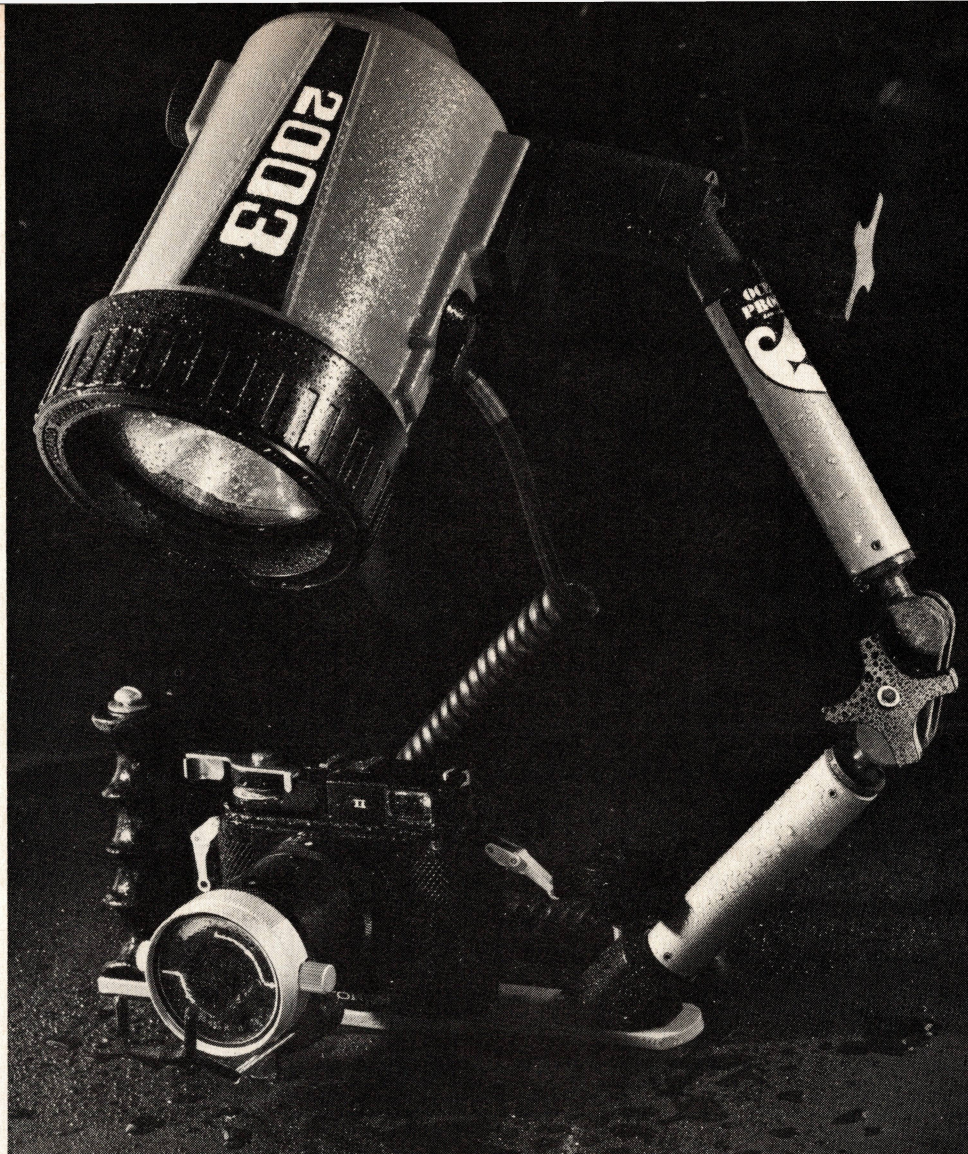




## AN EXCLUSIVE SDM PRODUCT REVIEW

# Oceanic 2003 U/W Strobe

the big brother  
to the 2001



By Jack McKenney

In 1975 Oceanic Products introduced a self-contained underwater strobe to the market that exceeded even their own expectations for reliability. The 2001 is lightweight, its dome port provides a 95 degree coverage, it's rechargeable in just four hours and it provides 360 flashes on one full charge. Of 2000 units in the field, less than a dozen have been returned for manufacturing defects. This is one excellent track record — almost unheard of in this business!

Bob Hollis, a brilliant designer of underwater photographic equipment, and in his own right an expert underwater photographer, is president and owner of Oceanic Products. Hollis knows and understands underwater photographic equipment design problems and really approached the design of this new strobe properly by enlisting the genius of Honeywell's electronic engineers. Honeywell is one of the larger manufacturers of strobe units in the U.S. Together the two companies came up with the working components for the 2001.

And now, it looks as though Oceanic Products is doing it again . . . introducing the 2003, a more versatile and more powerful model. This unit is basically the same as the 2001, but features several electronic modifications. There are three capacitors which provide two power settings — high and low.

(The 2001 has one capacitor and one power setting.) The added capacitance of the 2003 is higher than the total capacitance of the 2001. It's like taking three 1.2 volt flashlight batteries and adding two more batteries (totalling 2.4 volts) to come up with 3.6 volts. By a unique switching design system, one of the capacitors can be switched out to provide 2/3 power. These two power modes are indicated as high and low on the strobe, and a switch is used to select the desired setting. On the high setting the 2003 light output is brighter than the 2001 by 1/2 to one full f stop. The low power setting provides 1/2 stop less light output than the 2001.

The external configuration is aesthetically pleasing and functional — identical to its predecessor. The 2003 is 8½" long, 4½" in diameter at the body and 5" in diameter around the front ring. It weighs five lbs. in air, half an ounce in fresh water and 3/8th ounce in salt water. The blue Marbon Cylolac housing is an ABS thermoplastic, the same material from which motorcycle fenders and football helmets are made. Each unit is pressurized to 300 feet before leaving the factory. A black Delran threaded plug utilizing a static O ring seal is located on top of the strobe and leads into the charging receptacle. The on/off switch located underneath the strobe next to



the ready light should be in the off position when recharging the unit. A black retaining ring holding the dome port and reflector lamp in place is permanently secured with a factory seal. Removing it voids the one year guarantee.

The double power setting is especially useful in tropical waters. On shallow coral reefs with a bright sun overhead, the low power setting is ideal for flash-fill lighting. There is no more pleasing wide angle underwater picture than when the entire scene appears as though it was lit exclusively with ambient light. Yet you can clearly see the model's face inside the mask and there are no harsh shadows underneath the chin. When you're able to successfully come up with picture after picture lit this way, then you're on the way to becoming a good underwater photographer. The 2003 makes it a little easier to accomplish this. For example, if shooting ASA 64 film with an available light meter reading of f 4 at 1/60 sec., the 2003 at a distance of five feet, set on the low power setting will provide a soft pleasant fill light. The high power setting won't overpower the subject at that distance, but will add more sparkle and brightness. And there's a bonus when the strobe is used on the low power setting.

On the high power setting, the 2003 delivers about 280 flashes when the batteries are fully charged. On the low power setting the number of flashes increases to 450! That means you can expose 12½ rolls of 36 exposure film before having to recharge the strobe.

It only takes four hours to bring the unit up to a full charge. Goldtop GE nickel cadmium batteries are used which have the ability to withstand higher temperatures, allowing a quick recharge and a high rate of discharge. These excellent batteries also feature an indefinite storage life and a longer operating life than many other nicad batteries. A catalyzer is incorporated into the strobe to absorb hydrogen gas. In any housed battery system this is a very important feature to prevent gas buildup which could result in an explosion. Under no circumstances should the strobe be recharged longer than 24 hours as the batteries could be irreparably damaged.

On the high setting recycling time is approximately six seconds. On the low setting it is only four seconds. Although the neon ready light will come on at these time intervals it is always best to wait another second before firing the unit to be certain the anode voltage of the capacitor has reached its full light output potential. This is true of any strobe unit.

Oceanic Products has conducted extensive testing to come up with some accurate guide numbers for both topside and underwater photography. Next to experience, accurate guide numbers is the best method to determine correct aperture settings. The following are guide numbers for the 2003:

ASA	GUIDE NUMBERS	
	ABOVE WATER HIGH SETTING	LOW SETTING
25	65	40
64	110	60
160	170	95
UNDERWATER		
25	19	12
64	32	17
160	49	27

Remember that to use guide numbers, you simply divide the distance the strobe is from the subject into the guide number to come up with the correct f stop setting. For example: Shooting ASA 64 film underwater at a distance of five feet, on the low mode the aperture setting would be  $17 \div 5 = f 3.5$  (rounded off to the nearest setting). On the high mode it would be f5.6 to f 8.

Topside guide numbers will generally always be accurate, but the underwater guide numbers are only correct for the



*The 2003 is a versatile and powerful strobe. It has two power settings, high and low. The recycle time on the high setting is about six seconds and about four seconds when it is on the low setting.*



photographs by PPC Staff photographer Mike Hendrickson



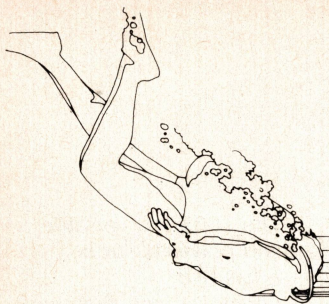
specific water conditions for which they were developed. The water conditions off Southern California are very different than in the Caribbean or the Red Sea, so you will have to adjust accordingly. It is important to shoot a test roll or at least bracket above and below the determined f stop to come up with the most accurate exposures in different conditions.

The 2003 utilizes a polished reflector. Hot spots have been eliminated by placing a straight xenon flash tube across it. The design allows for even illumination over the entire area it covers, while taking advantage of more light emitted than if satin reflector were used. The dome port allows for a coverage of 95° — wide enough for even the 15mm Nikonos lens.

The strobe also features a removable mounting pad to accept a panning knuckle head. This special head which sells as an accessory for \$48 allows fine adjustment for critical aiming of the strobe. The 2003 is available with electro EO connector or with Nikonos II or III connector cords.

At \$495 the 2003 offers the serious underwater photographer the choice of two power settings along with a rechargeable time of just four hours, a beam coverage of 95 degrees, and an amazing 450 flashes. If you're contemplating buying an underwater strobe, take a long, hard look at the 2003. Compare all the features and the odds are that you will opt for this fine, electronic ray of sunshine. ☛





# News Briefs

By Hillary Hauser



## SOS BARBA NEGRA

Last spring, the *Barba Negra* (Black Beard), a three masted, square rigged barquentine, left New York City for Bermuda. Her destination — mid-ocean; her mission — to serve as a marine laboratory for Save Our Seas, Inc., which planned to study the migratory habits of whales, porpoises and other sea mammals. The ship, built in 1896 as a Norwegian whaling ship, is owned by Canadian Albert J. Seidl, who is also president of SOS. Participants of the spring expedition included James Gott, author of the book *The Amphibian*, Frank Fennell, a film and deep water expert (both Gott and Fennell are with World Wide Divers, N.Y.) and U/W cameraman Branden Lutz. The month long expedition was to film the mammals, record their sounds, chart their migrations and in addition, the scientists planned to test the quality of sea waters in various locations. Expected to join the expedition were Roger Payne, cetologist, James Thorne, author and oceanographer, and Professor George Small of Richmond College, N.Y., author of *The Blue Whale*. World Wide Divers provided dive equipment for the expedition.

## NO. 2 MONSTER

Last year, a Canadian diver from the Manitoba Underwater Council did a little research and found that Lake Manitoba has had its own version of the Loch Ness Monster. Ross Newton, who did the research from a book by Peter Costello, writes that the mysterious animal was first sighted in 1908 and 1909 and was described as a huge creature swimming about two mph. "It had a dark upper surface

## DIVING: WHERE WE STAND

National funding for diving research is in a sad state. That's the feeling of Alan Purdy, deputy associate director for Washington operations of the Natl. Institute for Occupational Safety and Health (NIOSH). According to *Ocean Science News*, Purdy told NACOA (Natl. Advisory Committee on Oceans and Atmosphere) that federal spending for dive research should be expanded from the present \$2.4 million to \$7 million.

In the OSN report, six pressure chamber complexes now available for civilian research were listed: University of Pennsylvania, 1800 ft. depth rating, with a wet pot for inwater tests; Duke University, 1000 ft., wet pot; Virginia Mason Research Inst. (1500 ft.) but the institute has said it would like to be out of the dive business; Taylor Diving & Salvage, 2000 ft., wet pot ("mainly devoted to company's work needs . . ."); Tarrytown Labs, 1000 ft., dry; and Westinghouse Corp., 1500 ft., wet pot ("but they're going out of the diving business entirely"). Purdy also noted that there were no undersea habitats in U.S. waters and that the only one nearby was the *Hydrolab* in the Bahamas.

Last spring the Undersea Medical Society had just about finalized the "Natl. Plan for the Safety and Health of Divers in their Quest for Subsea Energy." The basis of this report, said Purdy, is that the diver is an indispensable component in energy recovery. OSN quoted Purdy as saying, "Divers will probably continue to be used up to their physical limits, about 5000 to 6000 ft.," Purdy said that oil companies already are working at 2000 ft., but that medical knowledge was not down to that level yet. "1000 feet," said Purdy, "even has some gray areas."

The Undersea Medical Society report has three principal recommendations: 1) That highest priority should be given to more careful selection and training of professional divers; 2) That second priority should go to greatly improving medical and paramedical care for crews and divers on oil rigs and platforms, and 3) That a "coordinating body in the civilian sector whose functions would be similar to those of the Office of Naval Research for the Navy" should be established.

Dr. Peter Bennett, Duke U. professor and UMS President, added, "Diving does put the human body under very severe stress," and that, "at the moment we don't have the knowledge to bring a man up from 600 ft. without some percentage of bends or silent bubbles (non-painful existence of gas bubbles in a diver's bloodstream)." Bennett called for increased federal support for research in diving medicine and physiology, and said the best solution for the present is an accumulation of records of divers' conditions, performances under stresses, and ailments. NIOSH had hoped to have a \$110,000 budget in 1977 for such a survey.

which glistened . . . and part of the body projected about four feet into the air." In 1935 another sighting at the north end of Lake Winnipegosis described the beast as having a single horn protruding from the back of its head, and a body that resembled a dinosaur. There were additional sightings and descriptions in 1948, 1955, 1957, 1960 and 1961. All of them added details to a general dinosaur-like description. Finally, in 1962, fishermen on Lake Manitoba reported that they had seen the animal and on August 12, two of them, with an American television commentator, photographed the monster for the first time. What they saw was a large, black eel like creature, a foot in girth, with about 12 feet of the monster above water. The head was not visible. Dr. James A. MacLeod, chairman of the Zoology Dept. of the U. of Manitoba, has conducted several searches for the animal and believes it possible that some primitive animals, long thought extinct (like the coelacanth) could still exist in such places as Lake Manitoba and Loch Ness.

## F-1 FOUND

Last fall, a search mission for a F-4 aircraft off the coast of La Jolla, Calif., resulted in the finding of the USS F-1, a World War I vintage submarine. The F-1 was lost when it sank in a collision in that area in December, 1917. The sub, which sits in 1440 feet of water, was first picked up by sonar. A deep submergence rescue vehicle (DSRV) was then dispatched, and its crew reported a gash in the port side of the F-1, which identified the vessel. The Navy has no plans to raise the F-1, which sank in ten seconds with 19 men inside.



## SEA POWER

Britain is spending \$1.75 million on a two year research effort to try to develop nonpolluting energy from ocean waves. (Wave energy is abundant around Britain in stormy winter months, and Britain has a very long coastline.) The Energy Dept. figures that if all goes well, a dozen arrays, each 50 miles long, could produce about half of Britain's current electricity needs.

There are now four methods being tested, first in tanks and then at sea: 1) The salter duck (proposed by S.H. Salter of Edinburgh U.). The ducks, linked in a long chain to form a breakwater, will rock in maximum response to waves. Motion of the outer part relative to a more stable inner unit could be used to drive a hydraulic system. 2) Contouring rafts — linked so that as waves pass, their rocking motion relative to one another would push in and pull out pistons within the links. 3) Air-pressure ring buoy — producing power from air pressure that is pushed out of orifices in the top of inverted boxes as waves rise and fall within. 4) Russell rectifier (inventor Robert Russell, hydraulics researcher) — non return flaps allow water to enter a high elevation reservoir as wave crests pass. As wave troughs pass, the water flows from a lower reservoir. The flow of water from upper to lower reservoirs could be used to generate power.

## \$75,000 FOR NESSIE

Perhaps by now we will know whether or not the summer expedition to Loch Ness produced photos of Nessie. The expedition, backed by the *New York Times* for \$75,000, was led by Robert H. Rines, Boston patent attorney whose 1975 photos of "something huge" stirred up world interest in Nessie again. Joining Rines were Dr. Harold Edgerton, inventor of strobe photography, and Charles W. Wyckoff, developer of the film used to photograph atomic bomb tests.

## DO RE MI FA SO LA TI BLUB!

It's for real: There is a group of musicians who are playing their instruments on the bottom of the ocean. The American Underwater Band, as they call themselves, began two years ago with the idea of creating a new music with new instruments and a new form of expression suited to and reflective of the underwater environment. The band did not want just to play land instruments in the water ("a pointless exercise and an interesting trick") but to develop new instruments that sounded right *only* in the water. So far the AUB has developed what they call the Burratone, Bohannon's Harp (a glass harp), Smith's Pipes, and of course the AUB. Another instrument, as yet unnamed, is a full octave xylophone like instrument developed by the group's engineer, Robert Burruss. The AUB admits they need time to develop themselves on these instruments. Keep in mind that a land musician must put in years of time before he or she becomes competent on an instrument that has centuries old history and a formalized technique... "The music we perform has no historical precedent."

The AUB, which has as its logo, "Developing Music in Man's Second Medium," has played in the Caribbean, has been a subject of a news article in the *Washington Post*, and has appeared on a television show in Washington, D.C., where they are based. Also, in May they were featured in *Smithsonian Magazine*. The band began a series of concerts in June, and in New York taped a To Tell the Truth segment for television.



AUB — making music in man's second medium...

## SPRING SURVEY

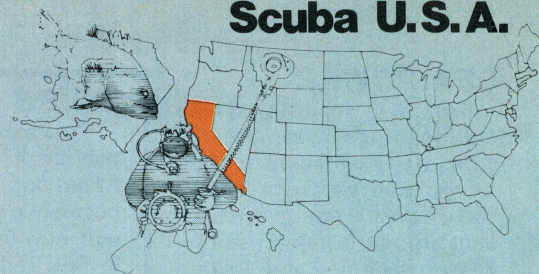
Little Salt Spring, which in the past has yielded human bones dating from 5000 to more than 10,000 years ago, is now the subject of an intensive year long study. The Florida sinkhole, 250 ft. deep, will be explored by U/W archaeologists, who will search for Paleo-Indian bones and artifacts which will eventually be housed in a museum. Head of the expedition is Carl J. Clausen, formerly with the Florida Bureau of Historic Sites and Properties and more recently with the Texas State Historical Survey Committee in Austin. Clausen has already moved to the site and will be aided by Dmitri Rebikoff, whose U/W cameras are being used to film the project, U/W photographer Pete Farmer, and other specialists. 100 acres surrounding the sinkhole have been fenced with barbed wire and will be preserved as a permanent site of historic and scientific interest. (Story information submitted by Kent Alverson.)

## ODDS & ENDS

A grey nurse shark attacked Australian shrimpboat fisherman Bob Page when he slipped overboard. The shark missed, became tangled in Page's shrimp net and is now Page's trophy... Virginia Institute of Marine Science got a \$450,000 Sea Grant to initiate an aquaculture program with George Mason University. Target will be oysters and scallops... A \$2.4 million military dive center for research, training and submarine rescue activities is being built at Sjodal, near Stockholm, Sweden, by the Swedish Navy. It's scheduled to open in spring of 1978... Another report of a friendly Calif. gray whale came in to the *National Enquirer*. In St. Ignacio Lagoon, Mexico, a 30 foot whale let humans in a rubber boat stroke its head and body. Gigi, zat you?



## Scuba U.S.A.



**L**ess than a dozen miles off the coastline of Ventura and Santa Barbara Counties in Southern California are the intriguing Northern Channel Islands. Here, dwarf mammoths roamed during the Ice Age and in 1542 Spanish explorer Juan Rodriguez Cabrillo discovered these islands and was buried here a year later.

Today, Anacapa, Santa Cruz, Santa Rosa and San Miguel Islands are visited by hundreds of boaters and divers monthly, who are discovering the primitive and enchanting beauty prevalent to these unspoiled Channel Islands.

Anacapa Island is part of Channel Islands National Monument, which is governed by the U.S. Dept. of Interior. Nesting grounds for the brown pelican, this island was named Anacapa by the extinct Chumash Indians. Meaning ever-changing, it appears differently from the mainland when weather conditions change. Anacapa is the closest of all the Channel Islands, as only 11 miles separate it from Channel Islands Harbor in Oxnard. Diving at Anacapa offers rich and abundant marine life, in usually clear water, occasionally up to 100 feet visibility during the fall and winter months. Lobster, abalone, and game fish abound for the underwater hunter . . . but for the underwater photographer it's a paradise. Huge rocky reefs blanketed with corynactis anemones lift up from the sand bottom making craggy canyons and crevices for the golden garibaldi to cruise about. Colorful brittle stars cover the reefs and bottom almost appearing to strangle fragile tube anemones, and multi-colored nudibranchs graze on the reefs in search of coral and hydroids, while the tube worm extends his magnificent plume to feed on the rich marine organisms living in the water. Giant columns of kelp reach upward toward the sun glistened surface, while marine snails and crabs graze amidst the twisting stalks and microscopic bryozoan live on its giant leaves. Lacy, delicate jellyfish glide through the maze of kelp, as schools of fish swim endlessly through this giant underwater garden.

A popular dive area at Anacapa is East



# California's Channel Islands

By Jim Cooluris

Fish Camp, tucked in the backside of the island offers a good dive spot and refuge from northwest winds. The depth varies from the shore to over 60 feet at the outer kelp bed. The heavy kelp close to shore hides many rocky reefs, some visible above water at low tide. Abalone can be found on these reefs as well as lobster in the shallow eel grass. The deeper rocks are havens for rock fish and octopus. Also, this is where the tuna clipper *Equator* sank in 1949. Not much is left except for a few scattered remaining pieces of junk, the rudder and anchor can be seen close to the cliffs of the island in about six feet of water.

My favorite spot for photography at Anacapa Island is on the north side of the island, just inside the west tip. This is called the Goldfish Bowl, since diving here is like swimming in a huge aquarium. Many garibaldi inhabit the tall crevices and cliffs underwater. Just 25 yards from the island, it's 60 feet deep with varying shallower depths to 20 feet at the islands edge. Sheephead, lingcod, cabezon, sculpin, calico bass, and many other types of fish abound here. The rocks are covered with multitudes of marine life, such as abalone, scallops, anemones, sponges and corals. The Goldfish Bowl is certainly one of the most beautiful areas of Anacapa Island. Since Anacapa Island is a National Monument, collecting of any marine life other than legal game is not permitted. This is to preserve the natural underwater beauty surrounding the island.

The largest of the California Channel Islands is Santa Cruz Island. Twenty-one miles in length, Santa Cruz is privately owned by two different interests. A popular island for the boater to spend days cruising, Santa Cruz has many small coves for a night's refuge, but as the other islands, there are not many public facilities. The early Chumash Indians inhabited Santa Cruz for over 300 years, sustaining on marine life and sea mammals.

Today, as in the past, Santa Cruz Island is rich with marine life, affording the modern sport diver with abalone, scallops, lobsters, and game fish. Huge kelp beds cover rock ledges and reefs rich with

photography by author



KELP DIVER

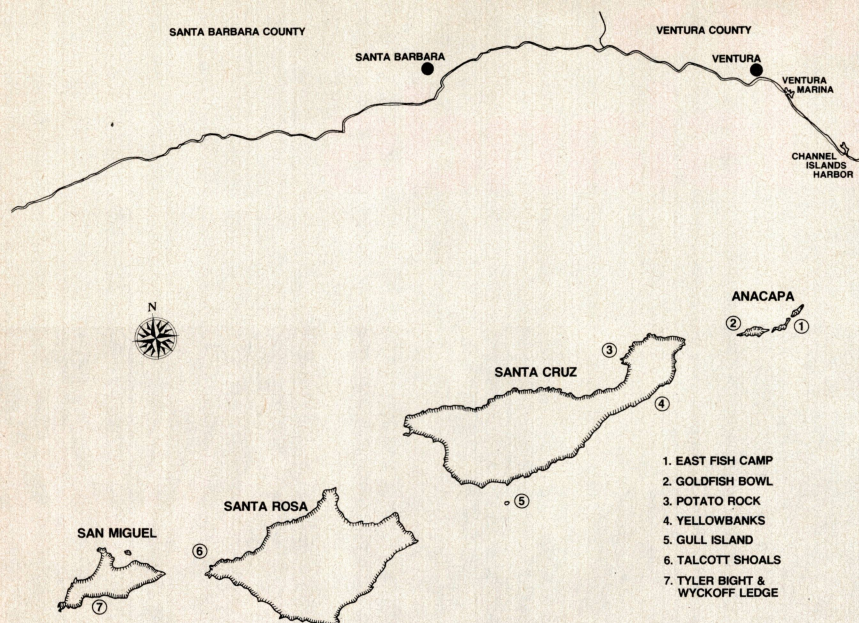


ANEMONE

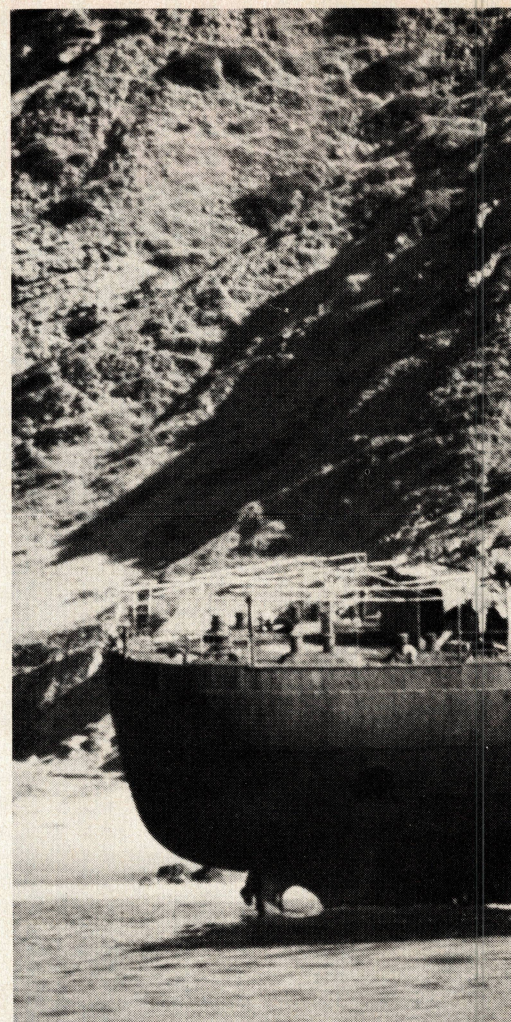


CALIFORNIA SCALLOP





Just a few miles off the coast line of California are the intriguing Northern Channel Islands. One of the prominent landmarks on Santa Rosa island is the wreck of the *Chickasaw*, a freighter that went aground near South Point sometime in 1953.



marine life. Underwater clarity varies from 20 feet to over 75 feet during winter months.

A great dive spot on the north side of the island is Potato Rock, outside of Potato Harbor in 85 feet of water. This is an enormous rock that is hidden 15 feet to 20 feet under the water's surface. *Corynactis* anemones and many other anemones cover this rock like living velvet. Rock scallops are plentiful here, including many varieties of rock fish, such as lingcod, and sheephead. Since my main interest underwater is photography, I especially enjoy diving Potato Rock, for here I can find many subjects large or small and the spectrum of colors range greatly.

The most popular dive area at Santa Cruz is Yellowbanks. Often dived, but plentifully abundant, Yellowbanks consists of a huge area of several square miles. Easily recognized by the lightly colored bluffs of the cliffs on the south side of the island, the depth varies from 15 feet to over 90 feet in a grand kelp bed. Huge scallops, red and white abalone seems to flourish here, as a diver can always find his limit here in one dive. Lobster seek refuge among the long rock ledges common to the underwater terrain at Yellowbanks. Occasionally the current comes up — quite strong at times — hiding the kelp well under the water's surface. Needless to say, this makes diving here impossible at best, so use discretion.

Gull Island, far on the back side of the island is a favorite dive area, but not often dived by the sport diver since it is almost 35 miles from the mainland. This is a relatively shallow area, mostly 10 to 30 feet with lots of kelp, big red abalone and sea urchins. Commercial abalone and urchin divers harvest Gull Island regularly, but still there is an abundance of game. Many sea lions and harbor seals inhabit the surrounding rocks and curiously check out the divers underwater. When underwater visibility is good, Gull Island is an underwater photographer's delight. Fish swim up and seem to pose for the

camera. Many colorful anemones live on the bottom as well as a species of unusual purple coral not found elsewhere on Santa Cruz Island.

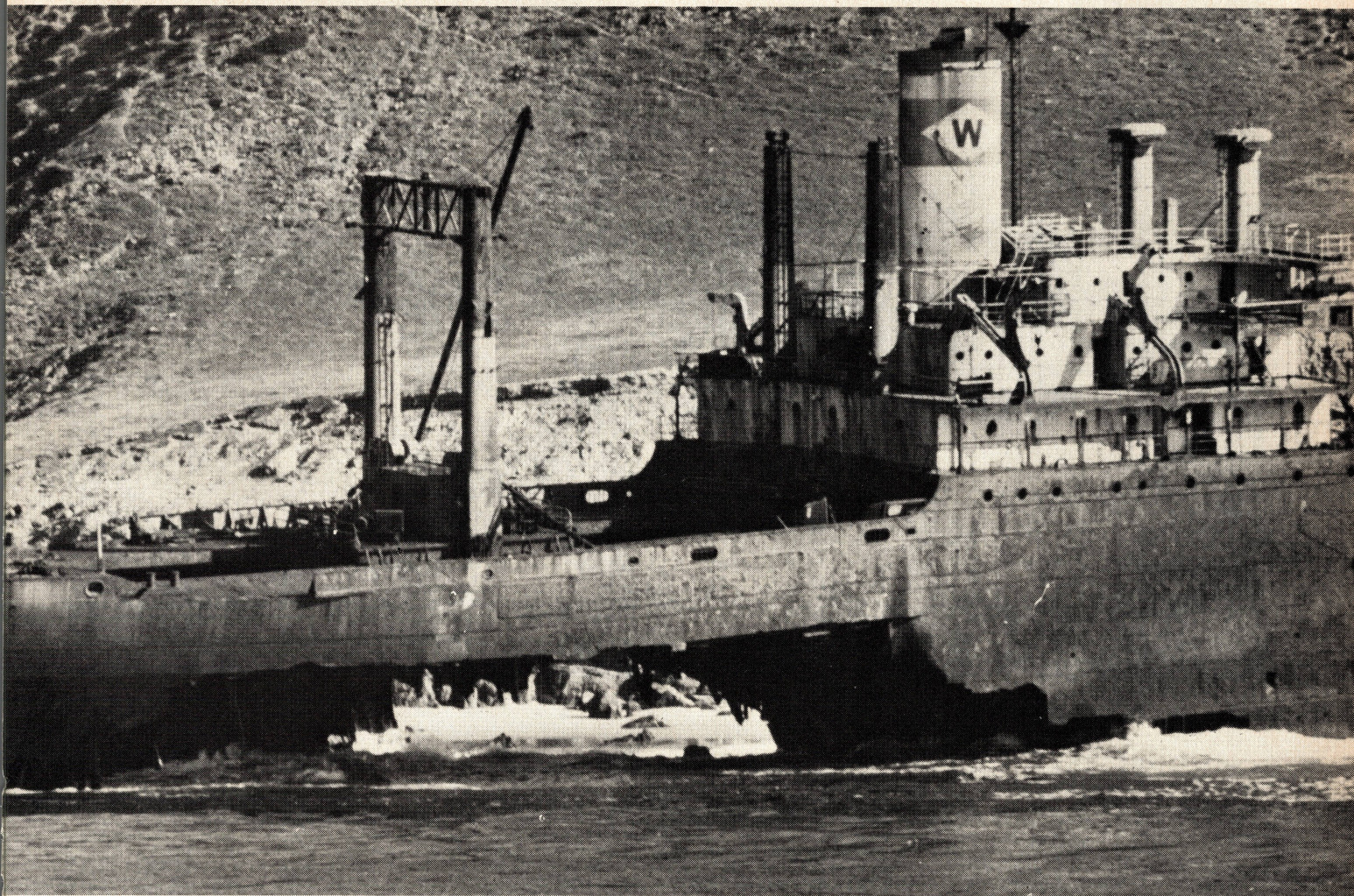
Santa Rosa Island is the third island in this chain. Almost 40 miles out to sea, it is privately owned by a cattle company, who operates a huge cattle ranch on the island. Archaeologists have discovered complete skeletons of a species of dwarf mammoths which roamed here in prehistoric times. These skeletons can be seen in their reassembled state at the Santa Barbara Museum of Natural History.

Dived mostly by commercial abalone and urchin divers, Santa Rosa offers good diving for abalone and lobster as well as the wreck diver. The *Chickasaw*, a freighter that went aground near South Point in 1953, is a prominent landmark. Visiting the wreck can be hazardous, as the ocean swells are sometimes huge and crash over the rusting hulk on the shore.

Talcott Shoals on the northwest tip of Santa Rosa is a popular dive area with depths from 0 to 60 feet. Long known for the big lobster and abalone that have been taken from here, the shoal area also is where the *Aggie* went aground here in 1915. Unfortunately, trips to the Shoals are blown out occasionally by the strong northwest winds and seas hitting this area.

Wind blown San Miguel Island is the farthest island from the





mainland, but it is the most historic of the Channel Islands and shelters the biggest marine life.

Spanish explorer Juan Rodriguez Cabrillo is thought to have been buried on San Miguel in 1543, only a year after he first discovered the island. To date his grave has not been found, although a monument has been erected on the island in his honor. Enormous sea elephants, fur seals and sea lions inhabit the shores of San Miguel Island, one of the largest rookeries of marine mammals in California.

San Miguel is owned by the U.S. Navy and maintained by the National Park Service. Entry on to the island is forbidden to protect the mammals and birds from intrusion by man. Even aircraft must maintain a minimum altitude of 1000 feet, as not to disturb the rookeries.

Again, dived mostly by commercial divers for abalone and sea urchins, the sport diver will find an abundance of big, red abalone. Underwater visibilities are occasionally reduced due to ocean swells and wind, although excellent visibility has been reported by certain commercial urchin divers who dive here often. On the south side of San Miguel Island is a good dive area, consisting of a sandy bottom with a few rocky reefs in a cove teeming with huge red abalone in shallow water. Halibut are found out in the sand. Nearby at Wyckoff Ledge,

large red abalone abound and the reef is alive with marine life. On the outside of the reef, 45 feet deep, underwater photography is especially good here when the water is clear.

Close, or remote, all these islands have dive grounds rich with underwater game, marine life, wrecks and scenery for the enthusiastic diver, whether you are an undersea hunter, explorer or photographer. Water temperatures range from the low 50's during the winter and early spring months to an occasional 70 during the summer and early fall months necessitating a quarter inch wet suit or dry suit for warmth.

The primary factor for planning a trip out to the Channel Islands is the weather. The Santa Barbara Channel, as it is called between these islands and the mainland, can be as placid as a millpond or a treacherous sea capable of taming an experienced skipper. During the late spring, summer and early fall months, heavy fog can reduce topside visibility greatly.

Camping is allowed on Anacapa Island since it is a National Monument, but only in designated areas on the east end of the island near the lighthouse. Facilities are nonexistent and you must bring your own food, water and firewood. For more information on camping on Anacapa Island, and how to get your equipment and supplies to the island, contact: The Island Packers, 1695 Anchors Way Dr., Ventura, CA 93003, or The





Typical of the California coastline are the giant kelp beds that rise from the ocean like columns reaching upward toward the sun.

National Park Service, 1699 Anchors Way Dr., Ventura, CA 93003. Both are located in the Ventura Marina.

Remember, the other islands are privately owned and going ashore is prohibited without prior written permission and then the permit is restrictive. For the major part of Santa Cruz Island, contact: Santa Cruz Island Co., 515 So. Flower St., L.A., CA 90071, or for entry onto the eastern tip of the island, contact: Francis Gherimi, 162 South A Street, Oxnard, CA 93030. For Santa Rosa Island, contact: Vail & Vickers, 123 W. Padre St., Santa Barbara, CA 93105. Going ashore on San Miguel Island is not permitted except for official business.

To get to the islands by private boat: Channel Islands Harbor in Oxnard is the closest point of land to Anacapa Island and the eastern tip of Santa Cruz Island. Be sure you have plenty of gas, since fuel or supplies are not available once you leave the harbor. You can check on the weather with the Coast Guard before you leave. Ventura Marina and Santa Barbara Harbors have docking and landing facilities also.

To get to the islands by charter boat: A great way to dive at any of these islands would be by one of the many charter dive boats making trips to the Channel Islands. The skippers of these dive boats know the good dive sites and you don't have to worry about the anchor dragging while you're underwater, or if the wind comes up — just leave the driving to the skipper, while you relax in a bunk during the return trip home.

If you want more information on trips to the Channel Islands, contact any one of these shops. They can supply you with the latest water and weather conditions along the coast or at the offshore islands. The diving at the Channel Islands is among the best around; try them for an unforgettable dive experience.

## CHARTER BOATS

**PORT HUENEME HARBOR:** The *Jeanne*, a 50-foot boat, write Port Hueneme Sportsfishing, Dock 1, Port Hueneme, CA 93041. The *Sea Ventures*, a 50-foot dive boat, write to Ventura County Skin & Scuba Schools, 2805 Palma Drive, Ventura, Calif. 93001.

**CHANNEL ISLANDS HARBOR:** The *Islander*, a 65-foot dive boat, write to Seafarer Dive Shop, 3600 Cabezon Way, Oxnard, CA 93030. The *Barbara Marie*, a 42-foot dive boat, write to Aqua-Ventures, 2172 Pickwick Dr., Camarillo, CA 93010. The *Sea-Bee*, a 45-foot dive boat and the *We-Seven*, a 40-foot dive boat, write Channel Islands Sportsfishing, 3825 Pelican Way, Oxnard, CA 93030.

**SANTA BARBARA HARBOR:** The *Coral Sea*, a 85-foot dive boat, write to Glen Miller, Breakwater, Santa Barbara, CA 93102. The *Emerald*, a 65-foot dive boat, write to Divers Den, 22 Anacapa St., Santa Barbara, CA 93102.

Ventura and Santa Barbara counties have a number of professional dive shops where you can obtain air, rentals, sales, service and information on the diving at the Channel Islands or along the coast.

**OXNARD:** The Seafarer Dive Shop, 3600 Cabezon Way, Channel Islands Harbor, Oxnard, (805) 985-6022.

**SANTA BARBARA Area:** The Divers Den, 22 Anacapa St., Santa Barbara Underwater Sports, at the Breakwater, Santa Barbara. Bob's Diving Locker, 500 Francis Botello Rd., Goleta.





## SDM PRODUCT REVIEW

# TEKNA T-100 MASK

By Paul J. Tzimoulis

It's a new mask from a new company, but with a distinctly familiar touch. The clean, swept back design lines and modernistic styling is the handy work of a man well-known to the dive world. Tekna is a new, avant garde dive equipment firm established by Ralph Shamlian, former president of Farallon Industries. With the reputation of a highly stylized innovator of dive products, Shamlian has resurfaced with a new company devoted to the development of a whole line of futuristic goodies. The Tekna T-1100 is their very first offering.

The T-1100 is an extremely lightweight mask, beautifully outlined in an attractive cherry red trim, and offering exceptional comfort. The mask only weighs nine ounces on land, thus putting it in the "featherweight" category.

The mask skirt is sculptured for maximum comfort, and permits the mask lenses to fit very close to the face. It is most definitely a low volume type mask, with only 220 cubic centimeters internal volume capacity. It takes very little air to equalize pressure at depth or to purge water from the mask. The close fit of the mask lenses offers a high degree of visibility, both upward and to the sides — a highly desirable vantage for spearfishermen. The side windows permit additional peripheral vision for detection of fish movement. You almost get the feeling you're sitting in the front bubble of a helicopter, with all the world before you. The sculptured nose pocket offers maximum accessibility for nose pinching during equalization on descents.

The T-1100 is not only beautiful to look at, it's also comfortable to wear. The mask skirt is made of pliable, soft neoprene rubber, with a double lip flange for a watertight facial seal. Pop it on your face and it sticks like glue!

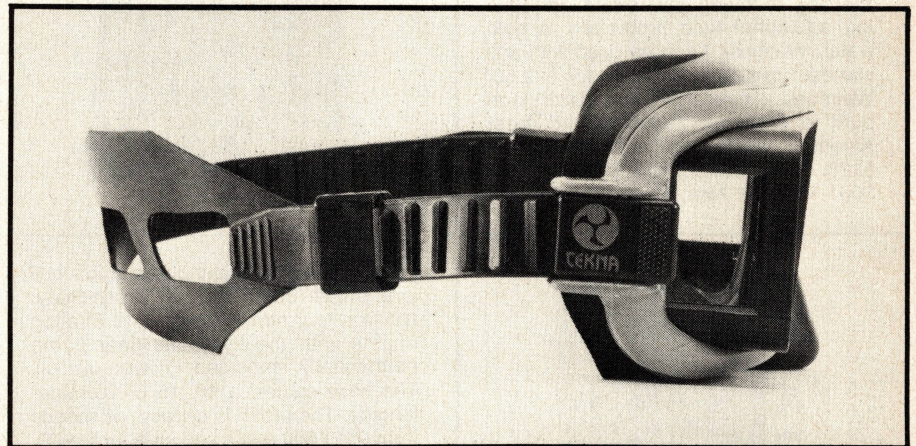
One of the neatest features of the T-1100 is its easily adjustable mask strap. Just press a lever on the side of the mask (either side) and the strap can be tightened or loosened instantly. Adjustment can actually be made while you're wear-

ing the mask. The mask strap passes through an ingenious little mechanism known as a roller ratchet Strap-Loc®. A small, spring loaded locking lever holds the strap securely in place. Still another feature of this mask is Tekna's new Strap-Keeper®, a rugged plastic strap collar which keeps the loose end of the strap from flopping around, and also prevents the end of the strap from accidentally slipping through the Strap-Loc®.

One of the major selling points of the T-1100 is its strength. Although it is small and incredibly lightweight, the mask is amazingly durable. The secret of its strength lies in the design of the glass lenses. Instead of one large faceplate area covering a large surface area, the Tekna T-1100 features four tempered

frame which is bonded with a new space age bonding cement. Every mask is inspected and tested for leaks before shipment is made.


As low volume masks go, the Tekna T-1100 is a real honey. It is attractively styled, extremely lightweight, comfortable, and rugged. What more could you ask for in a mask? The adjustable head strap and strap keeper features are the frosting on the cake. The Tekna T-1100 retails for approximately \$27.95 — expensive, but first class all the way. The mask should be available in most pro dive stores shortly, but you may have to shop around a bit. Limited supply is due to the new company's modest production facilities. However, Shamlian is feverishly working to stockpile an ade-



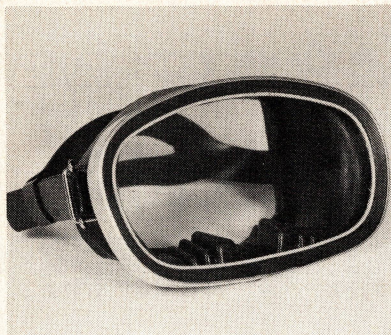
quate inventory in anticipation of the diving public's demand.

The glass is held securely in a rigid Cyclocac® frame — the same kind of material used for back packs and speargun handles. The Cyclocac® frame is not only tough, but holds the two front lenses in perfect alignment to prevent visual aberration or distortion. The two front lenses are made of 3/16 inch tempered safety glass and will meet the ASME safety glass specs and tests. The side lenses are made of 1/8 inch thick safety glass. The glass is set into the Cyclocac® frame and permanently sealed with an inner reinforcing

quate inventory in anticipation of the diving public's demand. If you cannot locate a store handling the Tekna mask in your area, write to Tekna, 3549 Haven St., Menlo Park, Ca. 94025.

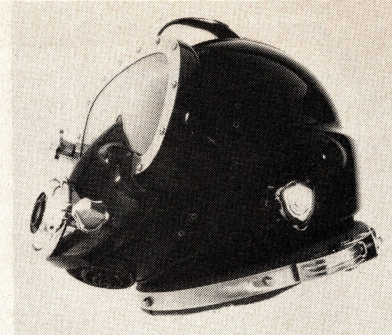
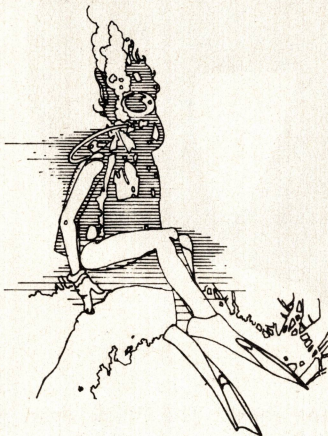
Incidentally, the T-1100 mask is only the first offering from this budding company. The stock numbers on the side of the mask box hint at other mask models — the T-1200 and the T-1300. For the present, Shamlian is keeping mum about his future brainchild. His only comment was a smile and "let's see how this one goes, first." 



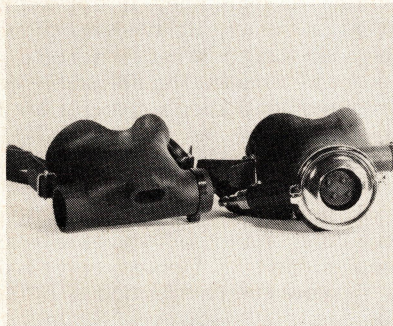


The Atlantis II mask now features nose pockets for easy equalization in addition to double edged face seal, tempered glass lens, stainless steel rim, locking straps, and color trim ring. The rubber is specially compounded to resist degrading from sunlight or ozone. This redesigned mask is selling for \$12.25 and is available from U.S. Divers Co., 3323 W. Warner Ave., Santa Ana, Calif.

## New Gear

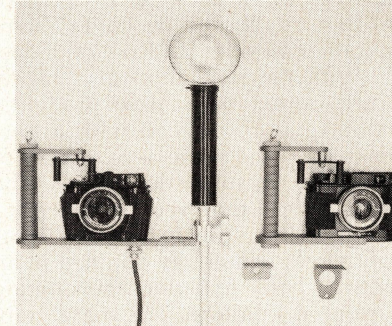
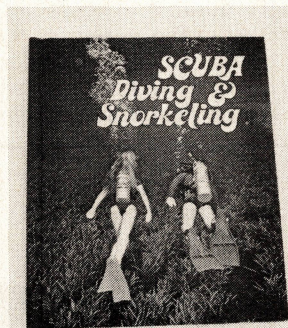


DMC-7 Dry Helmet has adjustable head and neck pads for the comfort of the individual diver. It is constructed of rugged, laminated fiber glass and has a sturdy neck ring seal with quick acting clamps. Larger ports and improved valves give increased gas flow capability. The Dry Helmet sells for \$1250 and is from General Aquadyne, Inc., 333 E. Haley Street, Santa Barbara, Calif. 93101.

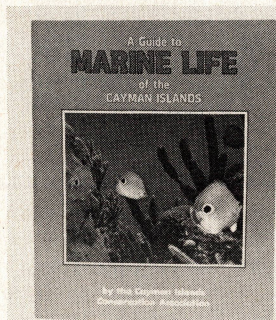


Wetmasks eliminate the bit mouthpiece thereby relieving jaw strain and giving additional face protection in cold water. Wetmask I can be used with any standard regulator and sells for \$32.50. Wetmask II has a standard 2nd stage built in and can be used with most American 1st stage regulators. It sells for \$128. From: Sound Wave Systems, Inc., 3001 Red Hill Ave., Costa Mesa, Calif.

You can now share the underwater world with the children in your life. *Scuba Diving and Snorkeling* was written for children grades 3 through 9 in mind. Featuring many underwater photos and words he can read himself, it is a great introduction to the sport. Sold for \$4.95, this colorful book is from International Aquatics Ltd., P.O. Box 939, 805 W. Monroe, Bloomington, Ill. 61701.

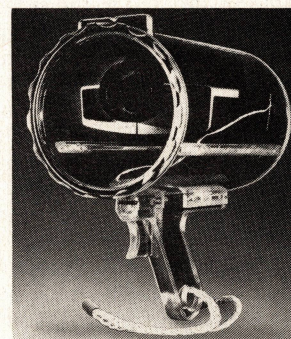
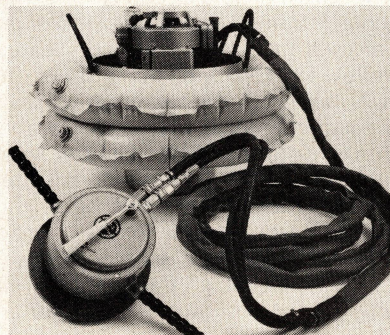


This top quality handle and trigger assembly is made to fit the Nikonos II and the Nikonos III cameras. They are precision machined out of aircraft quality aluminum. They have an anodized finish for corrosion resistance. Flash and strobe attachment brackets are available. Assembly is priced from \$49.95 to \$54.95. Sea-West, P.O. Box 1081, Renton, WA 98055.



The *Guide to Marine Life of the Cayman Islands* is a 48 page book with 70 black and white photographs and 40 sketches of Caribbean life, including invertebrates, and aspects of coral ecology and conservation. Priced at \$4.50, the book is published by, and is available from: the Cayman Island Conservation Association, Post Office Box 800, Grand Cayman, British West Indies.

The underwater cleaning of a ship's hull is a simple operation with Brush-Buoy. It has a four stroke Briggs and Stratton engine with the hydraulic gear pump permanently immersed in hydraulic oil. The hose comes in 10, 15 or 20 meter lengths. The brush is capable of speeds from 0 to 1500 rpm's and sells for \$6900. U.S. Phosmarine, Inc., 3186 Airway Ave., Costa Mesa, California 92626.



The Sea View I underwater housing is made to accommodate most 8mm movie cameras. It features single molded construction using optical grade Lexan, single handle design and a patented switch that permits run, lock, or continuously run. The housing sells for \$79.95 and is available from: Sea View Underwater Systems, Inc., 244 Mineola Boulevard, Mineola, New York 11501.



# THE ULTIMATE ADVENTURE

By Carl Roessler

**F**or a sport diver there is no comparable moment in the sea. Your eyes strain out into the distance to catch a first glimpse of Him, this beast of legend you've traveled halfway 'round the world to see.

You swivel right and left incessantly, back to back with another diver who is sharing the cage with you. Since both of you are watching, you're sure you'll see Him before — but suddenly out of the corner of your eye a vast shape blots out the sun. Despite the fact that both divers were watching constantly, the monstrous shark was once again within three feet of your cage before you saw him. . .

This ultimate dive experience for the sport diver has now become a reality with the successful inaugural of See and Sea Travel, Inc.'s first annual great white shark expedition. For the very first time, American sport divers have participated in a public expedition to film these elusive and profoundly beautiful sharks off the remote coast of South Australia.

And what an experience! On three different days we were favored with from one to three white sharks of 12 to 14 foot length making graceful passes within inches of our cages, and savagely biting 20 pound chunks of bait right in front of our eager cameras. Without hesitation we blazed away with the cameras, sometimes within inches of the huge mouths. At times their thrashing bodies thumped our cages, giving the occupants a memorable ride. At all times, however, the sharks seemed to perceive our cages as monolithic blocks, as obstacles to be passed on their relentless way to the proffered bait. At no time were we in the

cages the direct subject of attack.

See and Sea Travel, Inc., long known as the creator of underwater vacations for the avid sport diver, is very proud of the success of this new offering. For one thing, the logistics of the expedition are formidable. Using two 40-foot cruisers and over a thousand dollars worth of bait, each February expedition will create an irresistible dining spot to attract these enormous and graceful sharks. Under the expert supervision of Australian Rodney Fox, survivor of a 1963 white shark attack, the inaugural arrangements were flawless and a firm basis for future trips.

Success in attracting these great predators can never be guaranteed. Ron and Valerie Taylor, the well-known Australian dive team who were there as part of a television film crew, told us our three shark episodes represented good luck. "Sometimes we've searched for a week and gotten perhaps one shark," Val said. "These sharks must really like See and Sea. . ."

It certainly seemed that way. Despite our good fortune, however, there's no question that searching out these sharks is a waiting game. It's terribly difficult to be patient as the hours and days of waiting pass, but the only way to get the sharks is to remain on station, letting them follow the bait trail to you.

To while away the inevitable hours of waiting we took some shore excursions to Dangerous Reef, site of the underwater filming of *Blue Water, White Death* and *Jaws*. On another day we dived with the practically tame sea lions of Hopkins Island, major prey of the great white.

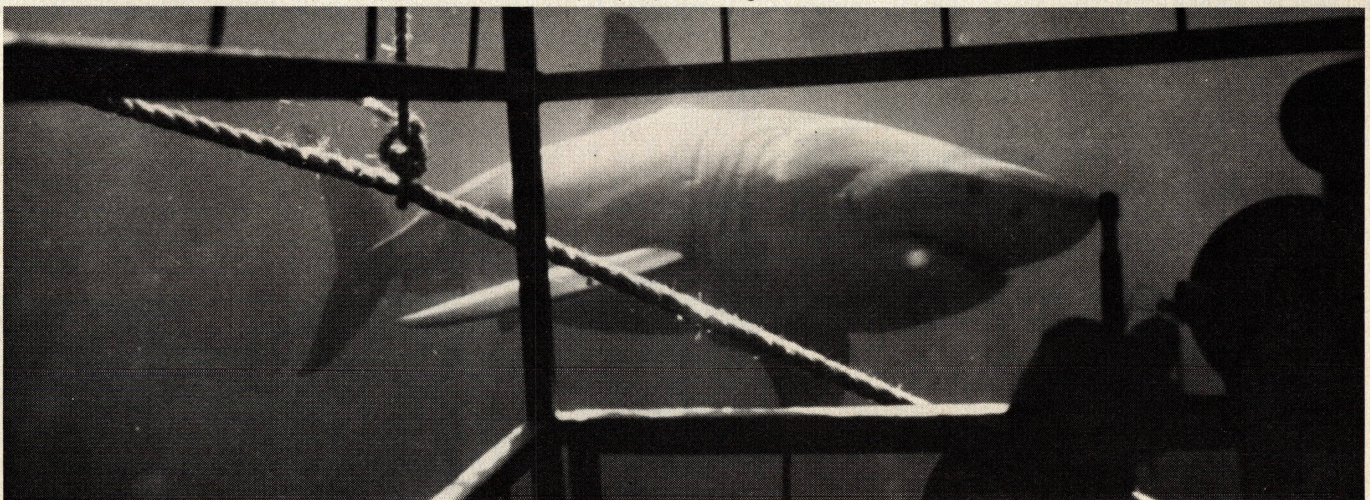
But always there was the tense feeling of expectancy. At any moment the sharks might appear. When they did, they fulfilled all our dreams of the ultimate photo subject. Enormous, graceful, deliberate, a relentless survivor of eons in the savage sea, they invariably appeared where least expected. Like some great toothed ghost materializing from the empty sea one would suddenly be *there, behind you!*, no matter how carefully you were scanning the surrounding waters. This uncannily stealthy approach is an important element of the mystique of these legendary creatures, and the prime reason for our use of cages.

Perhaps the most frequent and important question that was asked after the trip is, "Is it safe? Are we in real danger when we film these sharks?"

Now, after our triumphal inaugural it must be replied with assurance that this dive program is roughly analogous to filming white rhino or elephant from a Land Rover in East Africa. Despite the very best guides and equipment there is always the remote chance of difficulty. Indeed, that is the real spice of the trip. Still, thousands of photographers film these great terrestrial animals safely each season. A similar record of safety is expected by See and Sea.

To offer divers maximum filming opportunity, See and Sea's great white shark programs will only accommodate seven members each year.

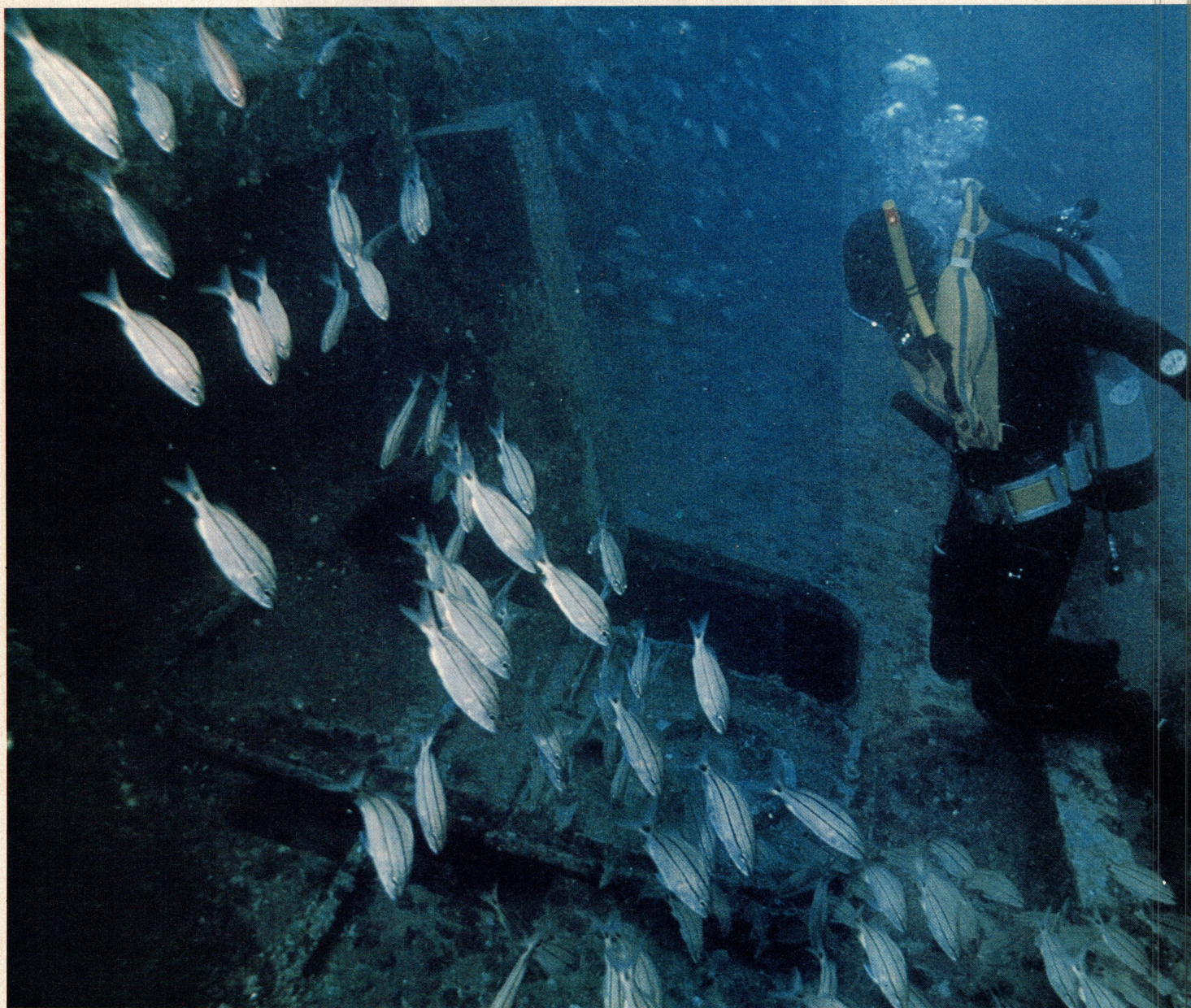
For further information on this incredible adventure, contact See and Sea Travel, Inc, 680 Beach St., Suite 340, San Francisco, California 94109. ➤



photography by Author



# WRECK DIVE NORTH



*Above, the open galley door of the Marjorie McAllister beckons a diver. Right, divers leave early and return after dark. A 12 hour day of diving here is not uncommon. Far right, a wall, with a door leading nowhere, stretches across the broad deck of the John D. Gill where this superstructure once stood.*





# CAROLINA

By Bill Lovin and Donald Keith

We rolled off our dive boat and below us we saw the faint outline of a giant ship, a World War II tanker. It was resting upright in the sand, intact, as if it could sail away if it were not under 90 feet of water.

The wide, flat deck stood 40 feet off the sand and formed a false sea floor covered with coral, sponges and tangled wreckage. Schools of amberjack flew in formation over the wreck. Large grouper used ventilator shafts for caves. As we sank toward the wreck we saw small tropicals swarming about the deck. The sun was shining brightly and even at 50 feet the colors of a large blue angelfish were still magnificent. It was a feast for the camera's eye. . .

Sounds like a great dive, doesn't it? Take a guess where this was . . . the Caribbean, Truk Lagoon? No, this dive took place in the good old U.S.A. just off the coast of North Carolina.

Mention East Coast diving to most divers and they think dark, cold water. Mention that the coast of North Carolina is known as the Graveyard of the Atlantic and that turns them off even more. But it's not like that.

North Carolina sticks far out into the Atlantic where it's brushed by the warm, clear waters of the Gulf Stream. Offshore, in the summer, visibility often hits 60 to 80 feet. Shipwrecks litter the coast and provide perfect homes for a variety of marine life transplanted from southern shores by the stream.

When you add clear water to exotic marine life and awesome wrecks you come up with a formula for an underwater photographer's paradise. And that's exactly what the Graveyard is.

Most sport diving takes place between Morehead City and the Wilmington-Wrightsville Beach area. Good wrecks and visibility are found in water 45 to 130 feet deep, 7 to 30 miles from shore, all along this stretch of coastline.

Here's a quick rundown on some of the most popular wrecks and best spots for underwater photography:

The *John D. Gill* is 500 feet long and one of the largest ships sunk in the Graveyard. It was blown in two by a German torpedo on March 12, 1942, about 27 miles off Wilmington. The bow, about 300 feet long, settled neatly on its keel in 90 feet. The deck is in about 50 feet of water and looks the size of a football field. Two tremendous anchors still hang from the bow and a spare anchor rests on the deck. Look for lots of fish, from big sharks to tiny tropicals, here. The stern lies one hundred yards away, pretty well broken up.

The *Papoose* sank March 18, 1942, off

Cape Lookout. This is another tremendous wreck, fairly intact, though rolled nearly keel up in 120 feet of water, 30 miles offshore. Visibility is usually good.

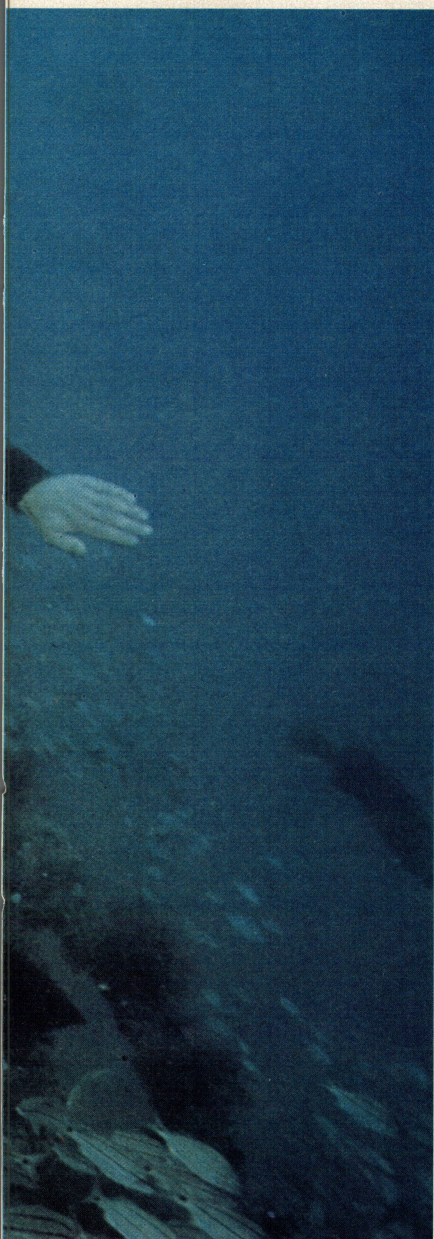
The *Marjorie McAllister* was called the most modern seagoing tug in the world when she was launched. She was thought to be unsinkable. But on Halloween night, 1969, that theory was proved wrong. The *McAllister* sank without a trace in a violent, week long storm. She became the object of an intensive search because many people believed the ship's five man crew could be trapped on the ocean floor, still alive in one of the tug's strong water tight compartments. She was not found for months though and the sinking remains a great mystery. The *McAllister* is small, 111½ feet long, lying 110 feet down 25 miles off Morehead City. It's a hard wreck to find, but worth the trouble. She is virtually intact lying on her side with superstructure and 12 foot prop still in place. The small size of the wreck lets you cram more into your photos. This is really Hollywood's idea of what a shipwreck should look like.

The *Hutton*, the *Portland* and the *Suloide* are all in 45 to 65 feet of water within eight miles off shore near Morehead City. They are World War II wrecks and are fairly broken up, though the *Portland* still has a very recognizable stern. They're all teeming with marine life and are heavily encrusted. Visibility is generally 35 to 50 feet and close-up photography is excellent.

The lure and romance of the graveyard is great and its stories are often entwined. The *Hutton*, a tanker, was sunk by a U-Boat torpedoed on March 18, 1942, the same day as the *Papoose*. The *Hutton* burned so brightly that the survivors of the *Papoose* which sank 20 miles further out to sea rowed to shore by the light.

The *Suloide* sank one dark, cold night a year and six days later. She had been playing cat and mouse with a German U-Boat for hours. It was late and the ship was running to the safety of land and port. Suddenly the *Suloide* Captain saw flickering lights of a vessel coming his way. He was sure the sub had managed to cut him off and was bearing down for the kill. He turned his ship and ordered "full steam." But not to escape, that was impossible. He would try to ram it.

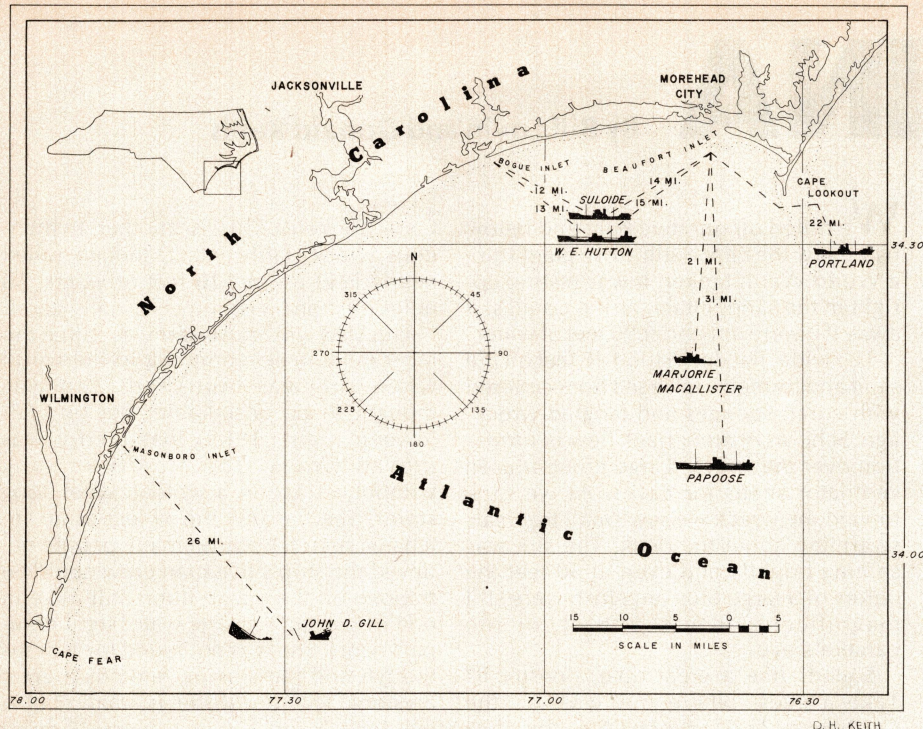
Suddenly there was the horrible sound of a collision but not with a submarine — The *Suloide* had ripped away part of its hull when it struck the sprawling carcass of the *Hutton*. The lights the Captain had seen were from a vessel trying to warn the *Suloide* of the submerged danger.



photography by Bill Lovin







Along the coast of North Carolina there are many fine wrecks to dive. Within a radius of 31 miles from Morehead City you'll find the Suloide, Portland, W. E. Hutton, Marjorie McAllister and the Papoose. Further south you will find the John D. Gill, 26 miles out from the Masonboro Inlet. Most of these wrecks are old World War II ships.

The *Suloide* sank less than a mile from the *Hutton*. The wreck, marked appropriately by Buoy 13, is now a popular spot for Sunday divers.

Seven years ago there was one air station between Morehead City and Wilmington. Now, there are three complete dive shops on the coast south of Cape Lookout. These shops carry complete lines of equipment and are more than happy to help you get wet. Divers unfamiliar with the North Carolina coast

who would like to arrange boat charters to the offshore wrecks are encouraged to contact a dive shop first. Most charter boat captains are dubious about taking out unfamiliar groups and prefer to book through a dive shop or tour operation.

In Morehead City contact the E.J.W. Bicycle Shop, located on highway 70 just outside of town. E.J.W. is probably the oldest air station on the coast.

Ed Huff's Underwater Schools of North Carolina, located at 2007 Lejeune

Bldv. in Jacksonville, is an extremely active shop. The shop is a veritable museum of artifacts retrieved from various Graveyard wrecks. In the past Ed has run trips to all of the spots mentioned in this article plus many others.

In Wilmington-Wrightsville Beach you can tank up at East Coast Outdoor Sports (formerly Underwater Sales and Engineering.) E.C.O.S. is located on the ocean in Wrightsville Beach and carries backpacking and hiking equipment as well as scuba gear. The owner of E.C.O.S., Jim Jessup, is a former Green Beret who took up diving a number of years ago, became a NAUI instructor in 1968 and was almost singlehandedly responsible for the appearance of a new breed of active divers on the North Carolina Coast.

Active inland shops are found in all major cities in North Carolina. Most of these shops are capable of arranging charters to the coast. The Sea Wolf Dive Shop at 2110 Hillsborough Rd. in Raleigh runs frequent trips to the *John D. Gill* wreck aboard the very fine charter boat, the *Whipsaw*. Two dive shops in Fayetteville, the Undersea Center and the Key West Diving Co. frequently charter boats in the Morehead City area. Both of these shops are located on Yadkin Road.

Graveyard diving is fun and exciting, but the same things that gave this coast the name Graveyard of the Atlantic make diving tricky and unpredictable. Sudden squalls coupled with shallow shoals create rough seas that have spoiled more than one dive weekend. The summer months are generally calm but even then the weather can become a source of frustration for divers.

Unfortunately North Carolina wreck diving is also somewhat more expensive than many visiting divers imagine. If your group charters a boat to visit one of the offshore wrecks you would expect to pay \$200 to \$250 per day for a charter fishing boat licensed to carry six divers.

You must remember that you're buying more than just a boat. You're buying an experienced captain plus loads of Loran and RDF gear. The point is — many of these wrecks are very far from land, marked with no buoys and extremely difficult to locate. One captain stated the problem succinctly when he said "Big ocean — small boat."

Also, not all captains can find all wrecks. Some very difficult wrecks like the *Marjorie McAllister* can be consistently found by only one or two captains. This is another reason that it is important to deal with a dive shop or tour operator if you're unfamiliar with captains. More than one group has been taken for long dull boat rides by captains who claimed to be able to find a wreck but couldn't.

After you've contacted a reputable dive shop or tour operator and let them

#### NORTH CAROLINA DIVE SHOPS

Aqua Haven  
5212 Hollyridge Dr.  
Raleigh, NC 27612

E. J. W. Sport Shop  
2204 Arendell St.  
Morehead City, NC

North Carolina School  
of Diving  
1712 B. Spring Garden St.  
Greensboro, NC

Underwater Sales and  
Engineering  
P.O. Box 765  
Wrightsville Beach, NC

Underwater Sports of  
North Carolina  
2007 Lejeune Blvd.  
Jacksonville, NC

Underwater Unlimited  
2704 Tuckaseegee Rd.  
Charlotte, NC

Undersea Center  
4762 Yadkin Rd.  
Fayetteville, NC 28304

The Sea Wolf Dive Shop  
3048 Medlin Road  
Raleigh, NC 27607

Piedmont Divers Supply  
1027 Chapel Hill Rd.  
Burlington, NC 27215

Key West Diving Co.  
6419 Yadkin Rd.  
Fayetteville, NC 28303

Scuba Locker  
Lejeune Blvd.  
Jacksonville, NC

The Porthole Dive Shop  
Radio Island  
Morehead City, NC



take care of your diving, you should have no problem handling the surface details of your trip by yourself.

Hotel accommodations can be as plush or as spartan as your budget allows. Wrightsville Beach and the Morehead City-Atlantic Beach area offer numerous resort hotels as well as hostleries that cater to the fishermen type.

One word of advice, though — North Carolina diving is rigorous and you might prefer a good night's sleep to the excitement of a swinging resort.

There are many good places to eat along the coast, however, sometimes it's difficult to find a place to get a substantial breakfast before your boat leaves the dock at five a.m. If you're in Morehead City, try Sonny's for breakfast. It's located on the municipal dock on the waterfront. Chances are your captain will be there, too. In the Wrightsville Beach area, try the Middle of the Island restaurant on Harbor Island.

After a long day on the open sea there's nothing like a huge seafood dinner. In Morehead City there's no need to even leave the waterfront after your boat docks and you've unloaded your gear. Just look around and pick one of the several restaurants that are built out over the water between the boat slips. Captain Bill's and the Sanitary Restaurant are highly recommended. Informal attire is entirely acceptable. When in Wrightsville Beach dine at the King Neptune restaurant — on Lumina Avenue just off the beach.

If you're flying into North Carolina you can connect with Piedmont Airlines in Raleigh or Charlotte and fly directly into Wilmington. Wheeler Airlines links the jetport at Raleigh with a small landing field at Morehead City with one flight daily. No rental cars are available in Morehead City so you'll have to arrange for a pick up with your dive shop or tour operator. But be sure to arrange for some personal transportation since docks, hotels, dive shops and eating places are usually separated by inconvenient distances. It's also possible to fly to Raleigh, rent a car and drive to the coast.

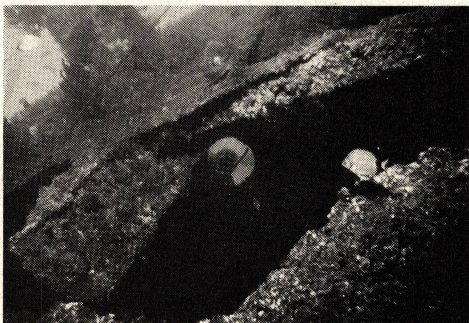
A complete handbook for North Carolina divers has been prepared, that offers North Carolina diving tours geared for the wreck diving enthusiast and underwater photographer. The manual contains history, descriptions and drawings of Graveyard wrecks, tips on photography and many useful bits of information. It's available for \$2.50 from *Dive the Graveyard*, Box 7, Polks Landing Station, Chapel Hill, NC 27514.

So after you've dived Cozumel and Cayman and looked at your underwater slides of Bimini and Bonaire a hundred times. Why not try something different?

Dive the Graveyard of the Atlantic — and bring plenty of film. 🐠



Above, Lynn Smith examines sea life on the deck of the John D. Gill's bow section. The broad, flat deck provides a false bottom 45 feet above the 90 foot ocean floor. Left, picturesque villages dot the coast of North Carolina. This is the town of Ocracoke, haunt of the famous pirate Blackbeard. Ocracoke is great to visit on a non-diving day.



Left, fish and diver eye each other through what's left of a porthole on the John D. Gill's stern section. Below, these giant bollards, once used to moor the John D. Gill, is now part of an artificial reef created on this ship by the sea.



photography by Bill Lovin



# NAUI

## A Pioneer And Leader

By Jeanne Bear Sleeper

**F**ive thousand, five hundred instructors and assistants training and certifying over 550,000 divers in the past 15 years. That is the story of NAUI, the National Association of Underwater Instructors.

NAUI has been a pioneer in the sport of scuba diving. Since its incorporation in 1960, NAUI has grown from a few hand-picked instructors at a certification course in Houston, Texas, to an international corporation training and certifying instructors and divers around the world. The quality controls that were established by the founders have proved to be fair and workable throughout the years. NAUI is recognized as a reliable leader in diver education.

NAUI is the only non-profit, tax-exempt educational dive association in the world. It is not funded or supported by any government or private industry. It is supported by the member instructors and others who purchase products and services.

Also unique to dive certification agencies is the NAUI elected Board of Directors. NAUI Instructors annually elect their representatives. This system has allowed for extensive member input in the development of standards and policies. Instructors have significant control over their own fate as well as that of the association. Besides the elected Board of Directors members, a system of part-time employees called branch managers are located across the country. The branch managers supervise and coordinate developmental and informational programs in their branches.

Other unique and innovative services from NAUI include NAUI's own publications. These specialized technical publications are prepared by NAUI to meet the critical informational needs of instructors and divers. These specialized books support the over 20 different certification courses provided by NAUI instructors. NAUI has been the leader in development of the introductory course and various specialty certifications.

Realizing the needs of the broader dive community, NAUI formed the NAUI Diving Association (NDA). This membership association encourages all levels of divers and nondivers to continue their education about the underwater environment. Subscription to NAUI News, membership cards, decals, emblems and discounts on NAUI's own publications and other books from the NAUI book catalog are some of the NDA membership benefits. More products and services are continually being added to the NDA package. Members can look forward to travel programs later this year.

Each year NAUI sponsors the largest dive conference held anywhere in the world. Open to all divers, instructors and the general public, the International Conference on Underwater Education is truly the dive event of the year. Shortened to its nickname, IQ, the conference will be held in San Diego, California, November 5-7, 1976. The 1976 Conference will be the eighth held around the United States and Canada.

As the dive industry has grown from its infancy, NAUI has acted as a responsible leader. It has been the first to offer guidance in such areas as Instructor Ethics Committees, up-



photograph by Mike Williams

grading all course standards, writing and printing technical publications, instructor liability insurance and more educational programs than any other agency.

A full-time professional staff supported by an administrative and clerical staff maintains the international headquarters in California. Close to the pulse of the dive industry, NAUI has devoted its leadership to fighting restrictive legislation. In fact, NAUI spent more time, money and effort than any other single agency in fighting legislation during the past two years. NAUI has led the way upgrading standards and ethics with the procedures and enforcement to protect the diving public and to prevent negative newspaper publicity, government intervention, legal actions and insurance problems.

Nationwide advertising of scuba diving as a safe, fun sport has been a major thrust by NAUI during recent years. Promotion of scuba diving with realistic expectations by the student has contributed to a healthy respect for NAUI instructors and their quality programs of instruction. Helping the entire sport and industry to grow in a positive cooperative spirit has also meant using NAUI resources to contribute to such groups as the National Scuba Training Council (NSTC).

NAUI instructors are a widely varied and talented group. They encompass the entire spectrum of professional occupations. Some teach diving as a full-time occupation, others teach professionally as an avocation. Regardless of whether they are employed by a retail store, school, university or club, NAUI instructors must maintain the same high standards of excellence. To find out the names of NAUI instructors in your area, write the NAUI Instructor Referral Service, Box 630, Colton, CA 92324. A custom list will be prepared and mailed to you for your hometown.

Divers may become NAUI instructors by successfully completing an Assistant Instructor Course and then completing an Instructor Training Course. Over 20 Instructor Training Courses are held each year across the United States, Canada, Japan and Europe. The comprehensive curriculum must uniformly be completed by instructor candidates.

Serving the members in as many ways as practical is the guiding principle of the NAUI association. By serving the instructor membership with products and services, the diving public is also served. The opportunities for cooperation with the dive industry as well as competition in the market place are vast. By operating the association as an independent business serving consumers, NAUI is able to maintain its independence and also its proficiency.

NAUI instructors train safe, effective divers who have fun and enjoy the sport. The NAUI association serves its members in many ways to help them achieve the association motto of "Safety Through Education".

Questions about NAUI or how to become a NAUI instructor? Contact NAUI Headquarters, P.O. Box 630, Colton, CA 92324 or in Canada contact NAUI Canada, Box 510, 10 Monet Ave., Etobicoke, Ontario, Canada M9C 4V5.



**S**tebco, a well-known midwest manufacturer of CO<sub>2</sub> safety vests, introduces its very first mechanically inflatable buoyancy compensator. The Stebco Buoyancy Compensator Vest, model 49 BCP, is their contribution to the burgeoning field of scuba diving's buoyancy compensators.

Stebco is well established in the manufacturing of CO<sub>2</sub> vests and has been successfully making them for 20 years. In this capacity they have not only produced vests under their own name, but they have also served as a submanufacturer and made vests for many of the major dive equipment companies. Stebco is also accredited with perfecting the first non-corrosive Cycloc plastic CO<sub>2</sub> inflator for the dive market.

The vest itself is the standard, slipover vest of around-the-neck, horse collar design. The material used in its construction is the lightweight, urethane-coated nylon. Not including its inflator hose, this bright, international safety orange BC weighs less than three pounds out of the water. The seams are ultrasonically sealed and stitched and have black synthetic piping for trim. There are gusset panels along the outside edge of the vest that are held flat with Velcro tabs. These tabs keep the vest flat against the diver's body, but also allow the panels to expand during inflation. This feature keeps the BC from feeling too bulky, and yet gives it the expansion and lift of a good sized buoyancy compensator.

The Stebco BC features one of the largest pockets in the entire field of buoyancy compensators. It measures 13 inches wide, six inches deep, and will expand to a thickness of three inches when filled. Practical in size, the pocket can carry everything from gloves, to decom meter, to underwater slate. The pocket is actually large enough to hold a Nikonos camera! In addition, the wide pocket flap is held in place by a seven inch strip of Velcro, and the pocket also boasts four ample grommets which let the water drain quickly.

The three nylon harness straps are each attached to the Stebco BC at the top, come forward and attach to the front of the diver via molded plastic buckle assemblies. These handy little buckles, made of non-corrosive plastic, have push button releases that make this BC extremely easy to get in and out of.

The Stebco BC features a newly designed low pressure air inflator system, capable of operating off the first stage of most any American made regulator. The short, but sturdy LP hose screws in a low pressure port of the regulator's first stage.



AN EXCLUSIVE SDM PRODUCT REPORT

## Stebco's 49 BCP Buoyancy Compensator

By Nancy Ackerman

The end of the LP hose that attaches onto the Stebco BC has a quick disconnect chrome plated brass fitting. The fitting has a positive locking collar and an O ring seal inside.

The hose itself is only 25 inches long because it connects to the BC at the top of the vest instead of at the bottom. It attaches to a fitting close to the top of the oral inflator hose, instead of looping all the way down to the bottom of the hose and snapping onto the hose by the mouthpiece, like many BC's.

A second low pressure hose hidden inside the corrugated oral inflator hose carries the low pressure air from the tank down another 14 inches to the controls at the mouthpiece. Next to the oral inflator mouthpiece at the end of the hose are two buttons — the one on the side is for mechanical inflation and the one on the end is for oral inflation and deflation.

The over pressure relief valve, designed to vent off excess pressure when the vest is fully inflated, is also installed in the end of the Stebco BC's hose. All these controls are located on the diver's left side and, consequently, all functions can be performed with one hand.

The Stebco 49 BCP buoyancy compensator is attractively priced at \$84, its low pressure hose is \$9. Although there is nothing especially revolutionary about this vest, it is sturdily constructed and well designed. Because of these factors, this BC is going to prove to be a competitive product in the vast, ever enlarging field of buoyancy compensators. Stebco will soon be adding to their line a vest similar to the 49 BCP with CO<sub>2</sub> inflation.

For more information concerning this BC, write to: Jack Pickering, Stebco Industries, Inc., 1020 West 40th St., Chicago, Ill. 60609.



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## Aqua-Craft in Canada

Wm. R. Martin, president of Aqua-Craft, Inc., announced that Multi Mark Agents, Ltd. of Whitby, Ontario, will represent Aqua-Craft's entire line of dive accessories and specialty equipment throughout Canada.

Multi Mark agents, Bob Pickard, Allen Monette, Bill Butterworth, and Don Clark, specialize in scuba and related products and cover the Canadian market.

Aqua-Craft, Inc. anticipates increased communication and service for its present Canadian customers through Multi Mark representation, offices, and display facilities in Whitby, as well as extension of the availability of Aqua-Craft products within Canada.

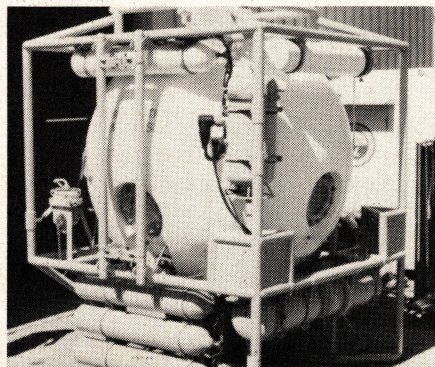
## Aquaventure Joins World Wide Divers

Captain Don Stewart, managing director of Aquaventure, Bonaire, has announced that World Wide Divers, Inc., of New York, has acquired a stock interest in Aquaventure.

World Wide Divers, Inc., is engaged in the dive travel business, retail sales of dive equipment and dive instruction throughout the United States.

Aquaventure is formulating plans to enlarge its facilities to accommodate the ever increasing number of divers traveling to the reefs of Bonaire. For more information about Aquaventure and Bonaire's reefs, contact: Nancy Van Leight, World Wide Divers, 155 East 55th Street, New York, NY 10022.

## IUC Delivers Diving Bell to North Sea



IUC International Inc. recently airfreighted a new 1250 foot diving bell to London for use aboard the *Venture One* semisubmersible in the United Kingdom sector of the North Sea. IUC presently has a contract with Placid Oil aboard the *Venture One* to provide diving and underwater services to as deep as 1000 feet. The new bell was designed and fabricated by Southwest Research Institute of San Antonio, Texas. It will be used in conjunction with IUC's 1000 foot saturation chamber, already aboard the *Venture One*.

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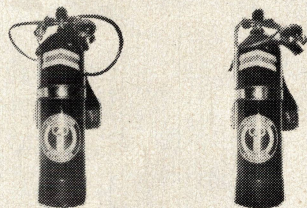
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## Grand Cayman Xmas Special

See & Sea Travel, Inc. is please to announce its annual Christmas special diving program to Grand Cayman, December 18-27. Escort for the program is Carl Roessler of See & Sea.



Aboard the 85 foot *Cayman Diver*, members will enjoy the finest and the most of Grand Cayman's fantastic reefs. From Tarpon Alley to the Great North Wall, the *Cayman Diver* is always anchored over superb diving.

Diving is practically unlimited because the divers live aboard the boat, and many fit in four to six tanks each day exploring deep and shallow reefs.

Since airline space is difficult during the holidays, members are advised to book early.

For further information contact See & Sea Travel Service, Inc., 680 Beach Street, San Francisco, California 94109. Phone: (415) 771-0077.

## U/W Photo Class On Heron Island

Walt and Jean Deas, well known underwater photographic team, are the new resident divers at Heron Island Resort, on Australia's Great Barrier Reef.

Walt and Jean will give instruction to scuba divers at the resort and take divers out into the surrounding reef on underwater explorations. They will also manage the dive shop which is well stocked with all the gear needed by divers.

Walt, who comes from Monifieth, Scotland, began skin diving in 1950 and was a pioneer of the sport in Scotland. Early in his career, Walt carried out research work for marine stations, dived for archaeology museums and discovered the sites of two lost galleons.

He is also a well known photographer and co-author of many books on the Great Barrier Reef and other famous underwater areas. He was named 1969 Australian Photographer of the Year.

In 1975 Jean won the Sub-Aqua underwater photographic award. As a team, Walt and Jean have filmed an underwater sequence for the Canadian Broadcasting Corporation, a movie for the Sudanese Tourist Commission and are working on a film on Heron Island.

For more information write Walt or Jean at the Heron Island Great Barrier Reef Resort, Heron Island, Via Gladstone, Qld 4680, Australia.

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By Bill Barada

**D**rifting downward through the calm, clear water off Key Largo Dry Rocks I watched an amazing scene taking place in the water below me. My companion, veteran dive guide Steve Klem, was kneeling on the bottom and a Spanish hogfish swam around him in erratic circles. The brown and gold body of the little fish actually quivered with excitement as it darted in and out, bumping and nuzzling at Steve's hands and head.

A large hogfish joined the act and put on an even more spectacular performance. Its body wriggled and twisted as it gyrated through the water in ecstatic maneuvers. Its spines were rigidly erect and striking color changes flowed through its body in waves of purple, blue, brown and orange. The hogfish darted around me a few times, then swam directly to Steve, nuzzling his neck, nipping playfully at his hands, and wagging its body. It was obviously a friendly greeting. The antics of the fish were like those of a dog wagging its tail in welcome to its master.

Before the day was over I learned that this strange behavior is the usual greeting Steve receives from his underwater playmates. He has made pets of hundreds of marine creatures throughout the John Pennekamp Coral Reef State Park. Whenever he enters the water, his finny friends come to greet him and put on a display of aquabatics to beg for a handout of food. After the fish are fed, most stay around to romp and play with their human companion.

There is no question that the fish recognize Steve as a friend. The same fish wait for him at different places in the park and come to greet him each time he enters the water. Some of his pets are waiting on the sand as soon as he drops the anchor. Others, especially grouper, actually swim up through 15 to 20 feet of water and greet him at the surface. As a result, Steve not only can predict what species of fish his customers will see at various places in the park, he can tell them what behavior to expect and what they should do in order to obtain great close-up photographs.

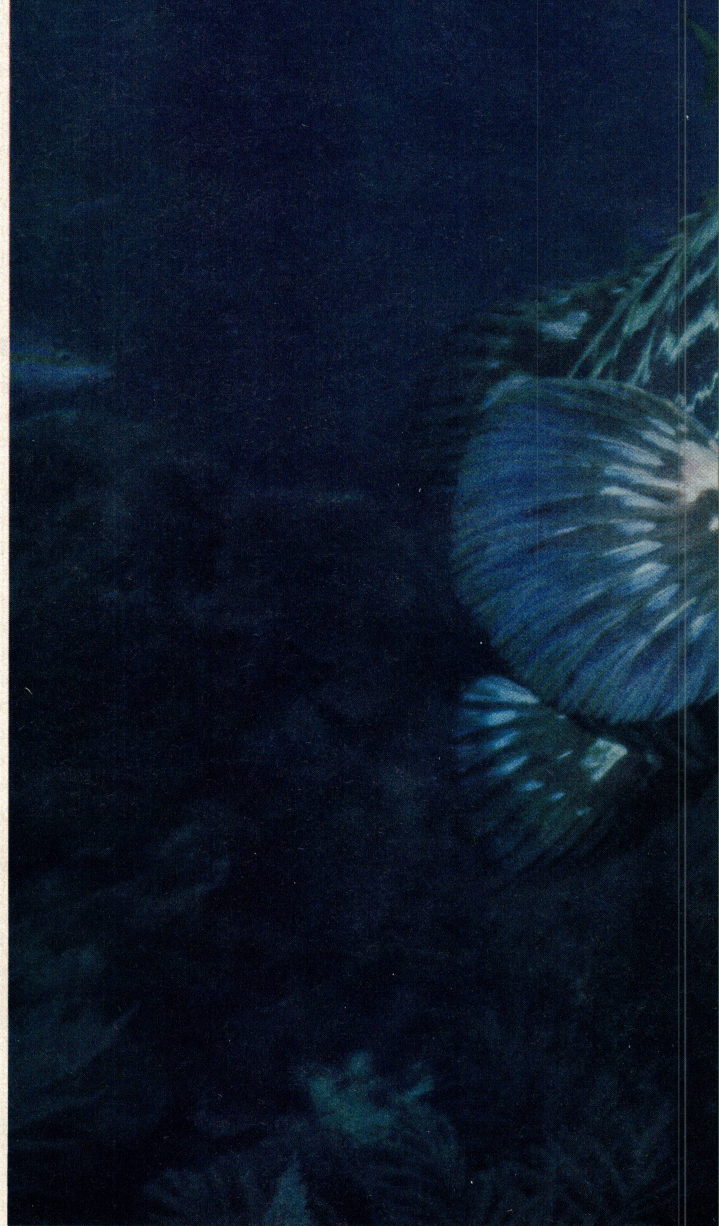
It is difficult to believe how tame some of these wild creatures have become. I watched a 40 pound grouper roll over on its side so Steve could pet it with the palm of his hand. A gray angelfish wriggled underneath his life vest as if playing hide and seek. Another gray angel seemed to enjoy being petted and it sat quietly in Steve's hands while he carried it around the

photography by Jim Doran



*Yellowtails are always eager for a handout.*

# UNDER WATER PLAYMATES



*Dive guide Steve Klem feeds one of his pet groupers.*







reef. Even the extremely shy butterflyfish and mangrove snappers have succumbed to Steve's charm and regularly eat from his hands. A rock beauty seemed attracted to his face mask so Steve stuck a piece of food next to the glass in the hope of getting an unusual photograph. The colorful fish became enraptured with her reflection in the glass and, like most beautiful women, couldn't resist posing and preening in front of her improvised mirror.

Feeding fish underwater is not a new hobby. Divers have been doing it from time to time ever since scuba was first introduced. But, Steve Klem is the only diver I know who has developed it into a full fledged hobby, or sport, and who has succeeded with such a wide variety of species. Getting wild fish to eat out of your hand is not easy. Anyone who has tried it knows that all except the tiny baitfish and wrasse are as difficult to approach as any wild animal. Taming a hogfish, grouper or snapper requires as much patience and perseverance as taming a wild deer, antelope, or bear. It is a challenge that involves the same diving skills, body control, breath control, alertness and concentration as spearfishing or underwater photography. All movements must be very slow and deliberate and breathing must be soft and regular. Any quick or jerky movement or any thrashing and splashing of arms, legs and flippers will frighten a wary fish and keep it at a safe distance. Even an excessive flow of bubbles from a regulator or an unusual noise will send a lot of fish scampering for shelter.

Steve's prowess at making pets of fish has attracted a lot of attention. Marine scientists are adopting his tactics to help in the study of fish behavior and other divers asked so many questions that Steve has written a how-to-do-it book on the techniques of fish feeding. The title is *Taming The Untamed* and it is 58 pages of information and photographs that describe how to begin making friends of different species, the proper bait to use, and some of the results you can expect to achieve. A big advantage of fish feeding as a sport is that it can be practiced in freshwater streams and lakes as well as in the ocean. Divers can make pets of trout, bass, pickerel, salmon and carp as easily as with reef fish. Underwater photographers who work with trained pets should be able to produce award winning pictures that make competitors green with envy. Another advantage of fish feeding is that it can be practiced anywhere, including areas where spearfishing is illegal.

*Taming The Untamed* is published by the Des Plains Publishing Company and can be purchased at book stores or ordered from Steve Klem, Post Office Box 1803, Key Largo, Florida 33032. It is a bargain at a price of \$2.95.

Fish feeding is also an excellent test of your "fish appeal," or "fish sense" as spearfishermen call it. This is a unique talent or ability that we know little about. But, just as animals seem to trust certain people more than others, fish also seem to have an affinity for some people more than others. That's why some photographers seem to have no trouble approaching close enough for close-ups of fish while others seem to scare the daylights out of every fish they see. That is also why some divers will probably never succeed in hand feeding game fish even if they try for many years.

We know so little about marine life that we can only speculate as to why some divers have fish appeal and others do not, but it is interesting to note that fish seem to reject female divers more often than they do men. With all due respect to the claims of women's lib advocates that there is no real difference in ability between the sexes, the fish apparently know the difference and stay away from females. At least this is the experience with Steve Klem's pets in Pennekamp Park. Steve has introduced hundreds of women to the art of fish feeding and in almost every case the fish avoided female divers as they would a dangerous predator.

One airline stewardess became so frustrated that she ac-

cused Steve of doing something that made the fish stay away from her. Steve finally enticed a grouper to eat out of her hand by letting the fish see them pass the bait back and forth between them several times. The grouper evidently decided that it either had to take food from the stewardess or go hungry, and it finally approached her and ate the bait. After that, the grouper continued to let the girl feed it, but it was still apprehensive and showed a definite preference for Steve's company. Steve refuses to speculate as to the reasons for this performance. He says he has enough trouble without getting into an argument over female psychology.

Steve's interest in making friends with fish stems from his love for Pennekamp Park and his sincere interest in conservation. He first migrated to Florida as a commercial fisherman, but fell in love with Pennekamp in 1946 and has virtually made the coral reefs his second home. He believes that Pennekamp is one of the world's most beautiful underwater playgrounds and there is seldom a day when he is not in the water. He thoroughly enjoys pointing out its wonders to visiting divers but he loves the water so much that he often goes out when the ocean is so rough that others stay home.

Like most old time divers, Steve was once an avid spearfisherman and he has great admiration for the sport. But, like many others, he believes that certain areas of the ocean, such as Pennekamp, should be set aside as marine preserves where the fish are unmolested. Steve claims there is no reason for animals in marine parks to be any more afraid of humans than the animals in land based parks such as Yellowstone and Yosemite. He has long argued that if divers would try to make friends with the fish instead of hunting and shooting them, marine parks such as Pennekamp would become underwater wonderlands and humans could learn a lot about the mysteries of the sea by studying fish behavior.

Steve has already learned a great deal from the behavior of his pets and some of his findings contradict popular beliefs about these little known animals. For example, fish are far from being the coldblooded, unfeeling creatures they are so often purported to be. Both Steve and Jim Doran, the photographer who works with Steve, cite numerous examples that show fish to be intelligent creatures that respond to affection and to pain in much the same manner as other animals. They have individual personalities and characteristics. Divers can distinguish Steve's pets from other fish of the same species, and from each other, by the way they swim, the way they act, and their reactions to each other.

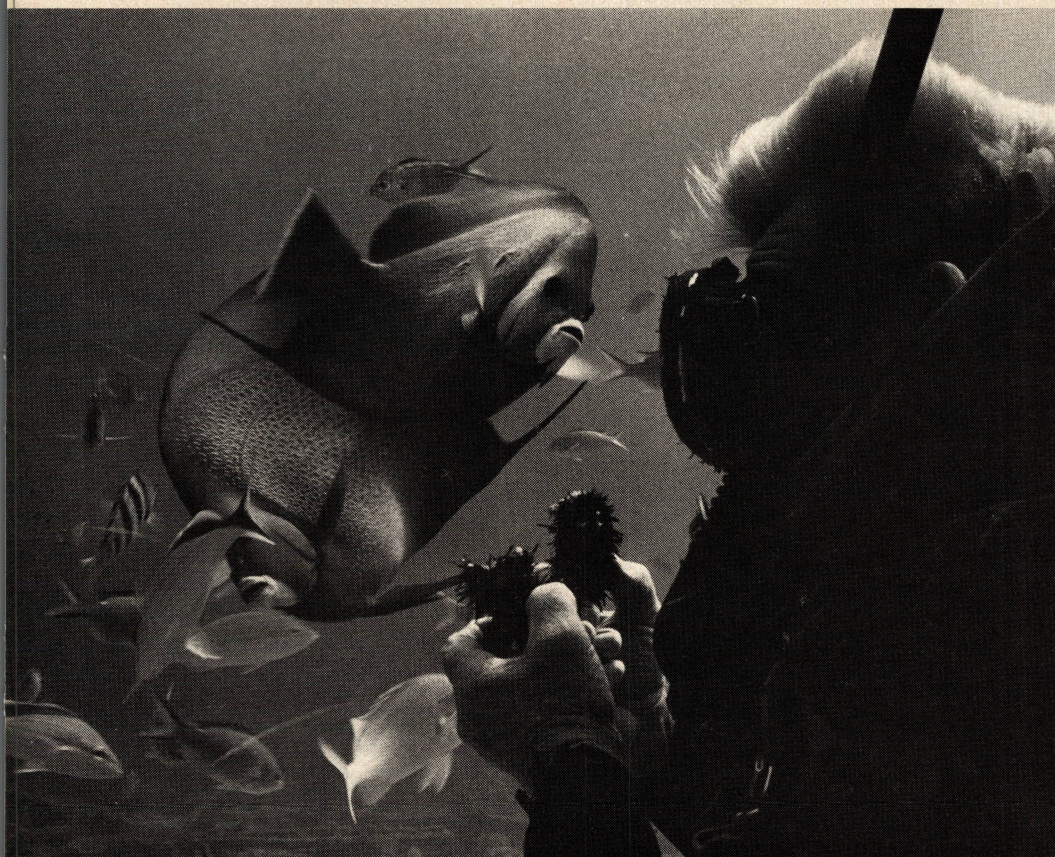
These fish recognize Steve among a group of divers and they come to him even when he is not carrying food. Jim Doran says that time after time he has seen the fish desert another group of divers who are feeding them and seek Steve out as soon as he enters the water. This holds true even when Steve tries to fool the fish by wearing different dive gear and bathing suits. His pets will eat food offered by other divers, but they show a decided preference for Steve and follow him all over the reef.

A surprising development occurred when Steve learned that grouper are more aggressive than great barracuda. Normally these two species avoid each other and it is commonly assumed that grouper are afraid of a large barracuda. However, both Steve and Jim say it is the grouper that is aggressive. A relatively small grouper will unhesitatingly charge a large barracuda and drive it away from the feeding area. Steve says they move so fast that all you see is a blur as the grouper speeds through the water and bangs into the side of the barracuda.

Such observations show how little we really know about marine life. Reputable publications have reported that barracuda slice larger fish into two pieces before eating them.

Steve has learned to play the role of peacemaker among natural enemies on the reef. He developed the practice of feeding two or three fish at the same time by holding bait in





*Through Steve's patience and perseverance, fish have become his friends. Whenever he enters the water, his finny friends come to meet him and put on a display of aquabatics to beg for a handout of food. Left, at Elbow Reef, two of his friends, a pair of gray angel fish, greet Steve. Below, he uses a stick to keep bait at a respectable distance from a moray.*

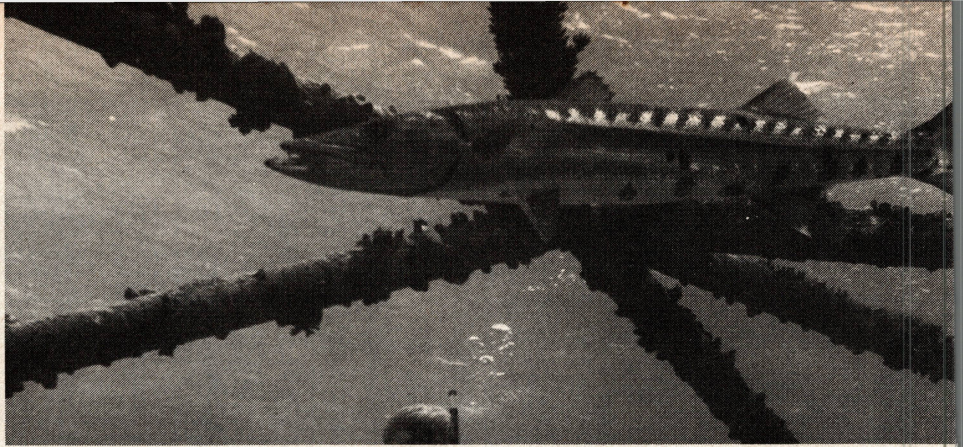
photography by Jim Doran







photography by Jim Doran



*Left, one of Steve's tiniest pets is this cocoa damsel. An aggressive defender of home territory, the damsel attacks the image in Steve's mask. Above is the large barracuda that became one of Steve's pets after a long time of coaxing. After hand feeding it with a grouper, the two fish developed a friendly relationship. Unfortunately, the 'cuda was killed by a poacher spearfishing illegally. The grouper mourned the loss of his companion by nuzzling the dead body.*

each hand. This encouraged species that usually fought each other to live in peace while being served at his dinner table. This worked on a hogfish and gray snapper. Every time the snapper tried to eat, the hogfish attacked and drove it away. Steve resolved the problem by holding his arms wide with bait in each hand so the hogfish would allow the snapper to eat. By gradually bringing his hands closer together the fish got used to each other and finally his "kids" were sharing the same dinner table with better manners than many humans.

Steve was trying the same tactics on another fish when a huge grouper caught him by surprise and sucked his entire hand into its mouth. Steve jerked his hand away, but the grouper's tiny teeth left deep scratches that bled profusely and the scars can still be seen when his hands get cold. This is the only injury of any consequence Steve has sustained. As a result of that experience he says he is more afraid of large grouper than either sharks or barracuda. In his opinion, they are the most aggressive and pugnacious fish he has yet encountered.

However, Steve finally succeeded in making peace between a big 50 pound grouper and a huge five foot long barracuda. He does not usually feed barracuda and does not advocate it as a practice for others. These fish usually hang around outside his feeding area and seldom overcome their wariness enough to come in and eat. Steve worked with them for awhile to study their reactions but he quit because he believes it is too dangerous. The barracuda are lightning fast and some dart in for the food with the speed of a bullet. Steve believes that if a diver holding bait should flinch or jerk at this moment he might lose a finger or suffer a nasty cut. Any fish might bite the hand that is feeding it, but unlike most species, a barracuda's teeth are long and razor sharp. A mistake with other fish such as a trigger, parrotfish, grouper, or even a moray eel, will usually result in a minor wound. But a bite or slash from a big barracuda could cause a very serious injury.

Steve warns that a diver feeding fish should never try to retrieve a dropped piece of bait. Fish strike at a loose piece of food immediately and grabbing for it invites a bitten hand.

The friendship between the huge grouper and the barracuda ended in tragedy. Steve had been feeding them together for more than a year and the two fish always appeared together and ate together in peace. The grouper would stand aside while the barracuda ate, then the 'cuda would back away and

wait while the grouper ate.

One day Steve found the barracuda lying on the bottom with a spear hole in its side. The 'cuda was still alive and its friend, the big grouper, was nuzzling its body as if trying to determine what was wrong. Steve said the grouper was nudging and snuffing back and forth along the length of the 'cuda's body and it continued this activity until Steve picked up the barracuda and took it to the surface. Steve showed the wounded fish to Mike Toner, a reporter for the Miami Herald, then returned the dead fish to the bottom. The big grouper returned to its nuzzling for a few minutes, then swam slowly away.

Surprisingly, spearfishing is quite common in Pennekamp Park in spite of stringent regulations against it and substantial penalties provided for offenders. Also, surprisingly, the vast majority of the poachers are Florida residents, so ignorance of the law is no excuse. The only logical conclusion is that Park Rangers are very lax about enforcing this regulation. This is supported by the fact that citations are few and far between, and the fines are mild for those who are convicted. This situation will probably continue unless public outrage against poaching fish in Pennekamp becomes as incensed as it is against poaching deer in Yellowstone, or sea otters off Monterey, California.

There might be some excuse for the diver who shot Steve's pet barracuda. These fish have been portrayed as dangerous and vicious denizens so often that many divers panic when one approaches. This is known as 'cudaphobia and the fear is just as real as if the diver had seen a shark. Steve's pets don't know this — and being nuzzled by a friendly barracuda would be disconcerting to an uninitiated diver.

There is absolutely no excuse, however, for the number of dead and wounded grouper, hogfish, parrotfish and angelfish that are left lying around the bottom of Pennekamp's reefs. Steve's pet 50 pound grouper disappeared shortly after the barracuda was killed and it has never been seen again. It is reasonable to assume that the spearfishermen that killed the barracuda returned later to shoot the grouper. If so, that diver and his friends know who he is, and he should feel the same pride in his achievement as if he had shot his neighbor's pet dog. It required about as much skill as shooting a farmer's milk cow, or shooting a pet deer that tourists have been hand feeding in Yosemite.





*Fish are far from being cold-blooded, unfeeling creatures they are so often purported to be. They respond to affection and to pain in much the same manner as other animals. Steve can tell his pets from others by the way they swim and react to each other.*

The saddest, and probably the most sadistic, story concerns Steve's pet queen angelfish. It required months to overcome its shyness and get it to feed out of his hands. But the fish became a prized pet that followed Steve and Jim Doran all over the reef. One day the queen disappeared and failed to show up for almost two weeks. When they saw it again the fish was a pathetic sight. Half its lower jaw had been shot off, the wound was still open and raw looking, and the fish was emaciated because it couldn't eat.

It required a lot of patience before the divers could get the wounded fish to even try to eat. When they finally overcame its fear of humans, the fish's injured jaw prevented it from tearing off and chewing a piece of shrimp. Steve and Jim broke off tiny crumbs which the angel could eat. They fed it every day for several weeks and had the satisfaction of watching the terrible wound gradually heal until no visible scars remained. This queen angelfish is still one of their favorite pets and comes to greet them each time they visit the area.

The intelligence of fish is demonstrated by how quickly they learn a new trick, and to avoid a new danger. A grouper that got caught in a boat propeller now runs and hides at the sound of a motor approaching. A hogfish that suffered a slash on its side takes off the moment it sees a diver with a knife.

This pet hogfish no doubt tried to nuzzle a strange diver who probably thought he was being attacked. The diver defended himself by slashing the unwary fish with his knife. One can easily imagine the story this diver tells about fighting off a vicious sea monster.

Steve's pets are too smart to enter a fish trap. He tried baiting them into several different types of traps but with no success. Even the yellowtail, that swarm around him in such numbers that they must be chummed away before his other pets can feed, refused to enter a baited trap.

His pets also refuse to take bait in which a fish hook has been hidden. He tried all kinds of hooks hidden in all kinds of bait. The fish consistently refused to take bait with a hook, but readily ate similar bait without a hook. And they ate the bait after the hook was removed.

The most amazing behavior is the fishes' reaction to divers with spearguns. Experienced divers have speculated for years as to whether fish can recognize a speargun as dangerous, or whether they simply avoid all humans as a threat to their


safety. Steve's experiences settle this argument beyond any possibility of doubt.

The pet fish react to approaching danger by darting into holes and crevices in the reef and they refuse to come out until the danger has passed. The bait can attract sharks and Steve's playmates disappear whenever one of these predators gets too close for comfort. However, Steve says the fish do not react unless the shark is close enough to be seen, and they come out to eat and play again as soon as the shark goes away.

His pets also disappear whenever a spearfisherman is near their area. They go into hiding while a spearman is much too far away to be seen, and they refuse to come out as long as he is in the water. Steve has checked this many times, and he can always tell if it is a spearfisherman that has frightened his pets. He has often gone to the surface and waited — and a spearman has invariably surfaced in the vicinity. The fish are so frightened of spearfishermen that they refuse to come out of hiding for a long time after they have left the water.

Steve double checked this theory by building a dummy speargun which a buddy carried into the water. His pets went into hiding the moment his buddy with the dummy gun appeared, and they refused to come out until the gun was aboard the boat. Steve then coaxed the fish out of hiding and began feeding them. But when he went to the boat and returned with the dummy gun, his pets again vanished into the reef. Their fear of a speargun was greater than their trust and confidence in Steve's friendship.

For this reason any attempt to make friends with fish in a popular spearfishing area is a waste of time. Even if you could succeed in overcoming the fish's fear of humans, you would be setting the pet up as an easy victim for the first diver who showed up with a speargun.

This is also a strong argument in favor of establishing more marine preserves and marine parks where spearfishing is banned — and an excellent reason for sport divers to respect and help enforce the spearfishing rules in places such as Pennekamp. The sport of spearfishing is admired because it involves the skill, ability and stamina of an underwater hunter. There is no skill or pride of achievement involved in shooting a pet fish, and the handful of selfish potatoheads who do it are robbing thousands of other divers of the pleasure of romping with these strange and friendly underwater playmates. 



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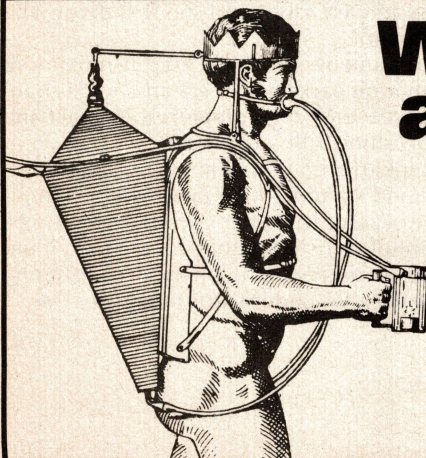
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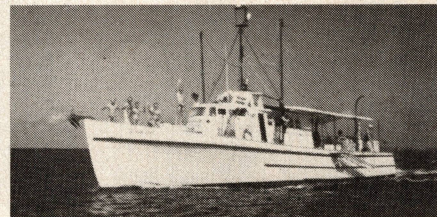
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For further information on these charters and other worldwide dive adventures, write See & Sea Travel Service, Inc., 680 Beach St., San Francisco, California 94109.

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A series of dive tours for veterans and beginners featuring tropical reefs and sunken Spanish ships off Cartagena, Colombia, are being packaged by World Wide Divers, Inc., New York, in cooperation with Avianca, the Colombian International Airline.

An eight day, seven night package is available that includes accommodations at the beachside Hotel del Caribe, five days of diving supervised by expert divers, transfers, baggage handling and tips, and hotel taxes. Meals are not included to allow participants freedom to eat out in Cartagena's excellent and inexpensive restaurants. Activities are also available for non-divers.

While participants should bring their own dive gear, heavy equipment such as rental scuba tanks are available.

For further information and illustrated brochure, contact: World Wide Divers, Inc., 155 East 55th Street, New York City. Telephone (212) 688-2510, or any of Avianca's 14 regional offices in the United States and Canada.



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## SDM Travel Section Little Cayman Adventures

The tranquil turquoise Caribbean surrounding Cayman Brac Island boasts a visibility of over 200 feet. Directly offshore in 15 to 40 feet of water, divers can see a rainbow of sea life: truly an underwater fantasia.

A stay at the Buccaneer is for the diver who's seen so many "diver's paradises" he's sure he's seen everything. It will restore his belief in a marine Eden. This is one of few places that provide the opportunity to dive the spectacular Little Cayman Wall off nearby Bloody Bay. Every serious diver should experience this live coral cliff that plummets 750 feet and deeper into the Caribbean. As the ocean floor fades away into blue infinity, divers find a panorama of pink lacy sponges, brilliant tropicals, and forests of black coral below 75 feet. The Wall is a marine metropolis of color and contrast.

The dive operation is run by Little Cayman Adventures, Ltd., through the Buccaneer's Inn, and provides three professional guides who take divers to the best spots aboard a 27-foot custom dive boat. There is also a smaller Seabreeze that serves eight divers, and the dive shop at the Buccaneer supplies tanks, weights, backpacks and belts for guests.

The Buccaneer has 24 modern, air-conditioned rooms, two duty-free shops which also offer native black coral and tortoise-shell crafts, and a new enclosed



bar where calypso music is heard on weekends. Reported to be some of the finest food in the Caymans, the Buccaneer buffet offers superb native seafood, from conch to dolphin and turtle. For the connoisseur of sea life on the table or on the reef, a stay at the Buccaneer will be a taste of paradise.

Trans Island Airways, Ltd. operates non-stop flights to Cayman Brac from St. Petersburg-Clearwater Airport on Friday and Monday. Currently, this is the only service in the world with regular flights to Cayman Brac; out-of-state groups fly into Tampa International Airport to make one of the connections.

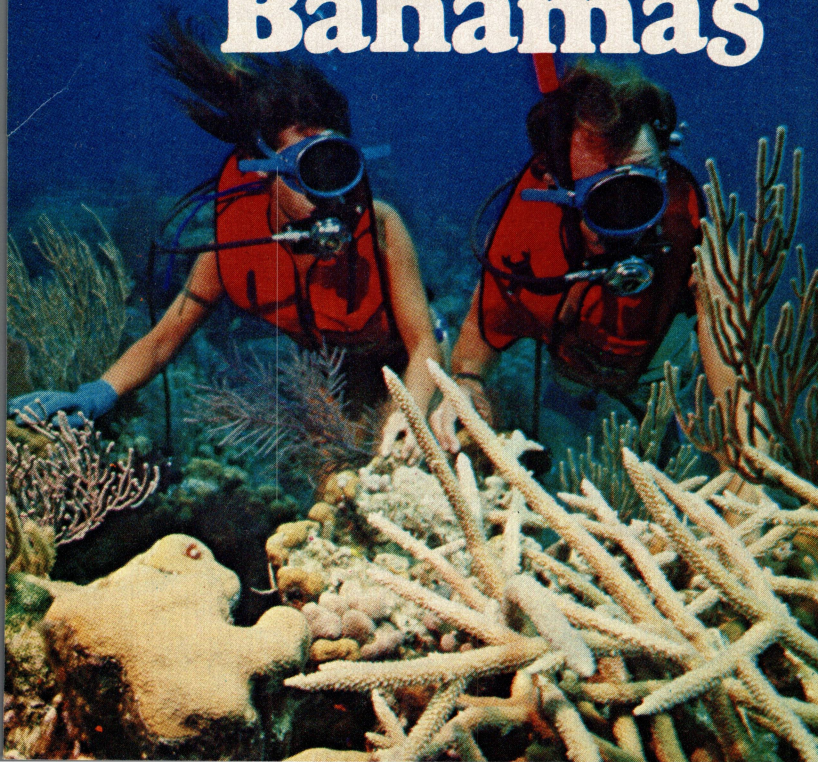
The Buccaneer's package combines Trans-Island Airways and Little Cayman

Adventures' services in a price that includes roundtrip airfare from St. Petersburg, ground transportation, room, and three meals daily. Boat trips, tanks, backpacks, and weights are provided.

During the few dry hours between dives, car and bicycle rentals are available for those wishing to tour the twelve-mile long island. The bluff on the east end of the island rises 140 feet above the Caribbean, and contains hundreds of caves once roamed by pirates — a popular site for photographers and explorers.

If you're interested in a unique dive vacation on a secluded island, write Little Cayman Adventures, Ltd., P.O. Box K-85, Land O' Lakes, Florida 33539, or call (813) 872-8416. ➤

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## McKenney Leads Galapagos Trip

See & Sea Travel of San Francisco announces that the March 9-26, 1977, Galapagos dive cruise will be escorted by Jack McKenney.

McKenney is the former editor of SKIN DIVER and has recently been on the film crew for *The Deep*, Peter Benchley's new book. For several years Jack's pictures and articles were featured in each month's SKIN DIVER. McKenney is also well known for his underwater film festival appearances and is planning to make a new film on this expedition. This should be an exciting activity for the members of the cruise.

The See & Sea Galapagos program features two full weeks of cruising and diving in these fabled islands six hundred miles off the coast of Ecuador. See & Sea's two boats, the *Laura Maria* and *Cathchar*, hold eight and six passengers respectively. The boats are fully equipped with compressors, tanks, backpacks and lead weights for all participants.

Divers will enjoy the unparalleled thrills of photographing marine iguanas, penguins, flightless cormorants, batfish and other unusual fauna, as well as taking daily shore excursions to photograph the giant tortoises, red-footed and blue-footed boobies, hawks, sea lions and a host of other terrestrial inhabitants.

For further information on this and other See & Sea adventures, write: See & Sea Travel Service, Inc., 680 Beach Street, San Francisco, Cal. 94109.

## Lisind Goes to Akumal

Lisind International has made plans for a dive vacation December 11-18 into the almost unexplored territory of Quintana Roo, on the Caribbean Coast of the Yucatan Peninsula. Participants will spend eight days and seven nights at Club Akumal Caribe in Mayan Bungalows, at the edge of virgin jungle.

Akumal is the home of CEDAM's Underwater Archaeological Museum, the first of its kind in the world, and the underwater recovery museum is only a short snorkel away in Akumal Bay.

The Dive Center Akumal, now under the management of Joe Kelly Hughes, an ex-U.S. Navy UDT Seal Officer, offers a full dive program. Three dive trips are scheduled daily to the barrier reefs, and in addition, special inland dive trips to the cenotes and lakes of the Maya can be set up for those divers who want to add one of the very unique dives in the world to their logs. For the real explorer, a visit is planned to the ruins of Tulum, together with an afternoon spent in the beautiful cove of Xel-Ha.

For information, write Lisind International, 5 World Trade Center, Suite 6383, New York, New York 10048.

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the time to scuba Bermuda.

\*Per person, double occupancy, Standard accommodations. Superior: \$156. Deluxe: \$171. (Both per person, double occupancy). Rates effective December 1, 1976 through March 14, 1977 and subject to availability. No refunds on unused dives/lessons. Airfare, government tax and tips not included.

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HOTEL**

Southampton, Bermuda



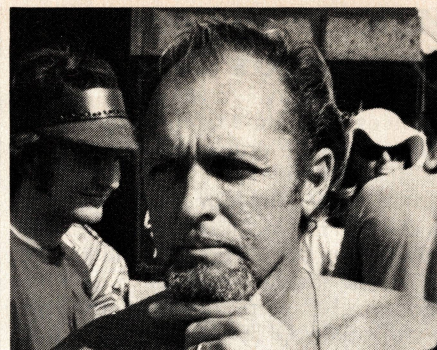
## Bonaire Expands

Arthur Frommer Hotels has been awarded a contract to assume management of the Hotel Bonaire effective August 1, 1976, as announced by the Government of the Island of Bonaire, Netherlands Antilles. The 60 room hotel is the largest on the island, and is owned jointly by the Bonaire Government and the central government of the Netherlands Antilles.

"An extensive refurbishing program

eral manager of the Hotel Arthur Frommer in Curacao. A new manager to work on the premises at the Bonaire will be hired. Eric Abdull will continue as assistant manager. Representatives for the Hotel Bonaire in the United States are Loews Reservations, Inc. with offices in New York and 17 other cities, and Ernest J. Newman, Inc. of New York City.

The island, with its calm, crystal clear waters, intricate coral formations and multi hued tropical fish has become a major center for scuba diving.



owned subsidiary, World Wide Divers, Inc., is also involved in retail sales of dive equipment and runs New York City's only professional dive shop. Aquaventure will continue to operate the dive facility at the Hotel Bonaire.

In another development on Bonaire, an expansion program is currently underway at the Flamingo Beach Hotel, second largest on the island, where the present 30 rooms will be augmented by an additional 24 rooms. Advance bookings for the Flamingo Beach and the Hotel Bonaire are high.

Other developments related to expansion of tourist activities in Bonaire involve the opening of a large new airport terminal building and a marina which can accommodate 50 boats and yachts.

More information on Bonaire is available from the Bonaire Tourist Information Office, 685 Fifth Avenue, New York, N.Y. 10022. Phone (212) 838-1797.



will begin immediately," Arthur Frommer said. The hotel will remain open during the renovation. Plans include the transformation of the lobby into a garden, the redesigning of dining facilities and redecorating of all rooms, as well as refurbishment of the exterior.

The Hotel Bonaire will operate under the supervision of Frank Maynard, gen-

The Aquaventure dive center, which is under the supervision of Captain Don Stewart, and located at the Hotel Bonaire, has become one of the largest single scuba diving facilities in the entire Caribbean. The Aquaventure facility was recently acquired by International Subaquatic Industries, Inc. in partnership with Don Stewart. ISI, through its wholly

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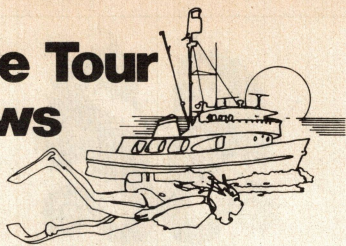
beach. For everything you need to plan your trip, see your travel agent or write Cayman Islands Department of Tourism, 250 Catalonia Avenue, Suite 604, Dept. D, Coral Gables, Florida 33134.

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## Dive Tour News



- Oct. 1, 8, 15, 22, 29 — BONAIRE — 8 days, Lisland Int'l, New York, NY
- Oct. 1, 8, 15, 22, 29 — HAITI — 5 or 8 days, Oceaneers Dive Tours Inc., Hollywood, FL
- Oct. 1 — COZUMEL — 8 days, Sunland Int'l Tours, Beverly Hills, CA
- Oct. 2, 10 — Bimini — 7 days, Capt. Tom Guarino, Dive Boat Annie-Up, Key Largo, FL
- Oct. 3 — BELIZE — 7 days, Go Diving, Inc., Minneapolis, MN
- Oct. 3 — BAHAMAS — 7 days, Berry Distributors, Inc., Alsip, IL
- Oct. 5 — Bimini — 7 days, Capt. Ed Deckard, Islanders' Cruises, Miami, FL
- Oct. 8 — BONAIRE — 8 days, Happy Wanderer Travel, Scarsdale, NY
- Oct. 9, 20, 29 — BAHAMAS — 7 days, Tropic Diving Cruises, Inc., Ft. Lauderdale, FL
- Oct. 9 — BRITISH VIRGIN ISLANDS — 12 days, Trimaran Misty Law, Hollywood, FL
- Oct. 9 — AQABA, JORDAN — 17 days, Rich Bergero, See & Sea Travel, San Francisco, CA
- Oct. 10 — SAN SALVADOR ISLAND, BAHAMAS — World Wide Divers Inc., New York, NY
- Oct. 10 — SAN ANDRES — 8 days, Go Diving, Inc., Minneapolis, MN
- Oct. 12-28 — AUSTRALIA/CORAL SEA — 17 days, Ron Merker, See & Sea, San Francisco, CA
- Oct. 15 — Bimini — 7 days, Capt. Ed Deckard, Islanders' Cruises, Miami, FL
- Oct. 16 — CARTAGENA, COLOMBIA — 8 days, World Wide Divers Inc., New York, NY
- Oct. 16 — GRAND CAYMAN — 8 days, Horizons Int'l, Seattle, WA
- Oct. 16 — CAYMAN ISLANDS — 8 days, See & Sea Travel, San Francisco, CA
- Oct. 16 — ROATAN — 8 days, Go Diving, Inc., Minneapolis, MN
- Oct. 17 — Bimini — 5 days, Capt. Tom Guarino, Dive Boat Annie-Up, Key Largo, FL
- Oct. 20 — FLORIDA CAVES — 5 days, Berry Distributors, Inc., Alsip, IL
- Oct. 21 — KONA, HAWAII — 5 days, Horizons Int'l, Seattle, WA
- Oct. 23, 30 — MAYA BEACH BELIZE — 8 days, Horizons Int'l, Seattle, WA
- Oct. 23 — COZUMEL — 8 days, Go Diving, Inc., Minneapolis, MN
- Oct. 23 — COZUMEL — 8 days, See & Sea Travel, San Francisco, CA
- Oct. 23 — BONAIRE — 8 days, See & Sea, San Francisco, CA
- Oct. 23 — BRITISH VIRGIN ISLANDS — 12 days, Trimaran Misty Law, St. Thomas, VI
- Oct. 23 — CARTAGENA, COLOMBIA — 8 days, Sunland Int'l Tours, Beverly Hills, CA
- Oct. 25 — Bimini — 7 days, Capt. Ed Deckard, Islanders' Cruises, Miami, FL
- Oct. 26 — AUSTRALIA/CORAL SEA — 17 days, Carl Roessler, See & Sea Travel, San Francisco, CA
- Oct. 29 — HERON ISLAND — 14 days, Bay Travel, Corona del Mar, CA
- Oct. 30 — FREEPORT — 8 days, Go Diving, Inc., Minneapolis, MN

(Continued on Page 80)

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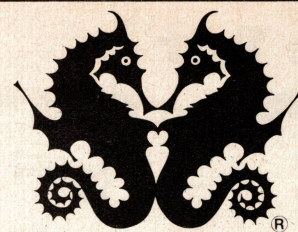
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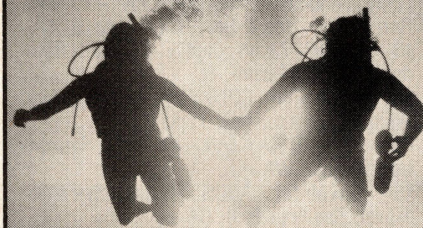
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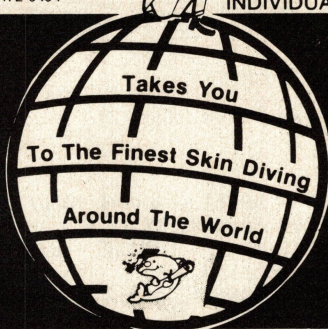
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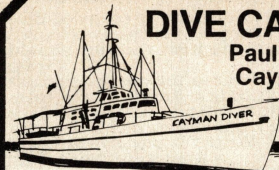
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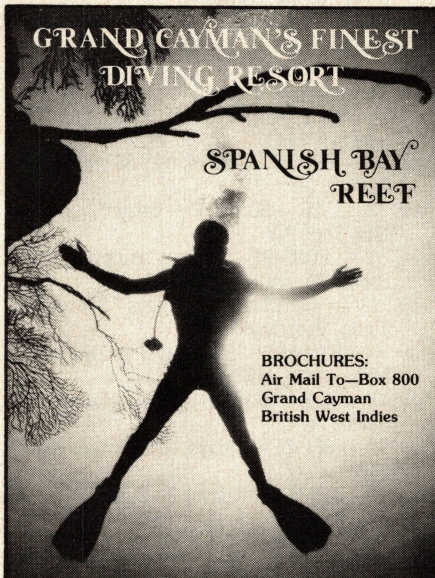
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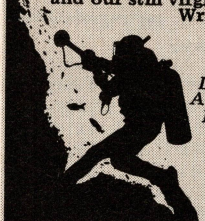
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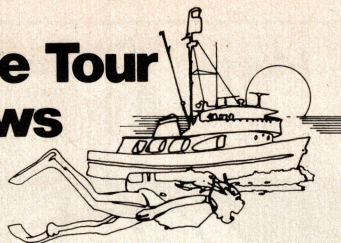
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(Continued from Page 77)

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- Nov. 5, 12, 19, 26 — BONAIRE — 8 days, Lisind Int'l, New York, NY
- Nov. 1, 6 — BIMINI — 5 days, Capt. Tom Guarino, Dive Boat Annie-Up, Key Largo, FL
- Nov. 5, 12, 19, 26 — HAITI — 5 or 8 days, Oceaneers Dive Tours Inc., Hollywood, FL
- Nov. 6, 13, 20, 27 — MAYA BEACH BELIZE — 8 days, Horizons Int'l, Seattle, WA
- Nov. 6 — CAYMAN ISLANDS — 8 days, See & Sea, San Francisco, CA
- Nov. 6 — FLORIDA KEYS — 7 days, Berry Distributors, Inc., Alsip, IL
- Nov. 7, 23 — BAHAMAS — 7 days, Tropic Diving Cruises, Inc., Ft. Lauderdale, FL
- Nov. 7 — SAN SALVADOR ISLAND, BAHAMAS — World Wide Divers Inc., New York, NY
- Nov. 7 — BELIZE — 7 days, Go Diving, Inc., Minneapolis, MN
- Nov. 12 — BELIZE — 7 days, NASDS store/school, Denver, CO
- Nov. 12, 19, 26 — BONAIRE — 8 days, Lisind Int'l, New York, NY
- Nov. 12 — BONAIRE — 8 days, Happy Wanderer, Bronxville, NY
- Nov. 12 — COZUMEL — 8 days, Sunland Int'l Tours, Beverly Hills, CA
- Nov. 14 — SAN ANDRES — 8 days, Go Diving, Inc., Minneapolis, MN
- Nov. 18 — KONA, HAWAII — 5 days, Horizons Int'l, Seattle, WA
- Nov. 19 — BELIZE — 7 days, NASDS store/school, Phoenix, AZ
- Nov. 20 — ROATAN — 8 days, Go Diving, Inc., Minneapolis, MN
- Nov. 20 — COZUMEL — 8 days, See & Sea Travel, San Francisco, CA
- Nov. 20 — CAYMAN ISLANDS — 8 days, See & Sea Travel, San Francisco, CA
- Nov. 27 — GRAND CAYMAN — 8 days, Jack's Dive Center Inc., Plainville, CT
- Nov. 27 — COZUMEL — 8 days, Go Diving, Inc., Minneapolis, MN
- Nov. 27 — SEA OF CORTEZ — 9 days, Sunland Int'l Tours, Beverly Hills, CA
- Dec. 3, 12, 27 — BAHAMAS — 7 days, Tropic Diving Cruises, Inc., Ft. Lauderdale, FL
- Dec. 3 — BONAIRE — 8 days, Happy Wanderer Travel, Scarsdale, NY
- Dec. 3, 10, 17, 24, 30 — BONAIRE — 8 days, Lisind Int'l, New York, NY
- Dec. 3, 10, 17 — HAITI — 5 or 8 days, Oceaneers Dive Tours Inc., Hollywood, FL
- Dec. 4, 11, 18, 25 — MAYA BEACH BELIZE — 8 days, Horizons Int'l, Seattle, WA
- Dec. 4 — BELIZE — 7 days, NASDS store/school, Huntsville, AL
- Dec. 4 — FREEPORT — 8 days, Go Diving, Inc., Minneapolis, MN
- Dec. 8 — FLORIDA CAVES — 5 days, Berry Distributors, Inc., Alsip, IL
- Dec. 11 — AKUMAL — 8 days, Lisind Int'l, New York, NY
- Dec. 12 — BELIZE — 7 days, Go Diving, Inc., Minneapolis, MN

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 July 2 — CAYMAN ISLANDS — 8 days, See & Sea Travel, Inc., San Francisco, CA  
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 Aug. 20 — COZUMEL — 8 days, See & Sea Travel, Inc., San Francisco, CA  
 Aug. 20 — BONAIRE — 8 days, See & Sea Travel, Inc., San Francisco, CA  
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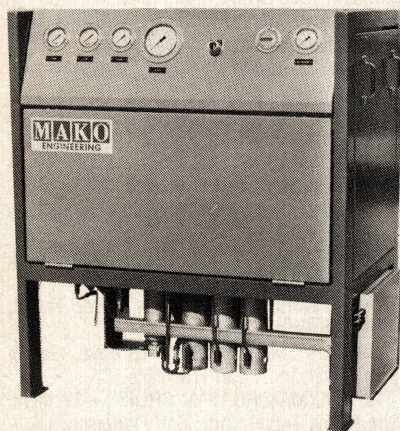
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### DEMA Show in Miami

The first annual dive equipment show will be held January 16-18, 1977, in Miami Beach, Florida. The dealer and dealer employee show, sponsored by the Diving Equipment Manufacturers Association, DEMA, will be open only to those who fit within that category.

The show will be held at the Sheraton Four Ambassadors Hotel, 801 S. Bayshore Dr., Miami, Florida. Rooms have been reserved, but space could be limited, so make your reservations as soon as possible. The telephone number to call is: (305) 377-1966.

The show's activities will include seminars on: merchandising and marketing, retail financing and inventory control, and will feature business speakers on legislation. Informative films and a cocktail party will also be part of the program.

DEMA is a nonprofit organization. Any funds derived from the show will go toward a fund to oppose undesirable legislation related to our sport.

### Divers Flea Market

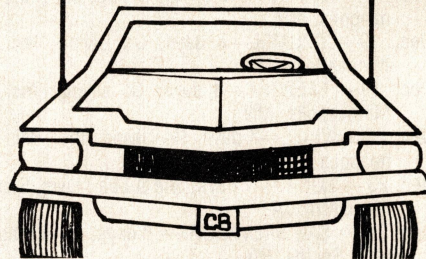
The Southampton Submersibles Dive Club will sponsor a Divers Flea Market at Southampton College, Saturday, October 9, 1976.

New and used sport and commercial dive equipment will be for sale or trade, from 10 a.m. until 5 p.m. in the college gymnasium.

Exhibits of dive antiques and artifacts, underwater photography gear, and underwater vehicles will also be on display.

Dive shops, clubs and individuals wishing to reserve selling space are asked to contact: Richard M. Casella, Box 246, Southampton College, Southampton, New York 11968, (516) 382-4000 Ext. 338 or 331.

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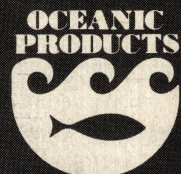
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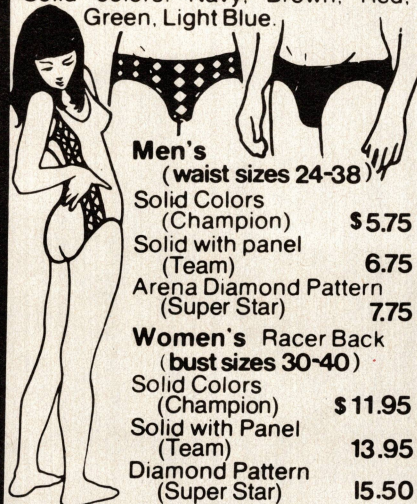
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## Medifacts

(Continued from Page 29)

Two more things that result in higher CO<sub>2</sub> are the increased density of air at depth, and the restrictive effect of a tight wet suit, since both add to the work of breathing. A fourth factor is reduced sensitivity of the body's CO<sub>2</sub> sensing apparatus, so that it takes a higher level to stimulate breathing. This occurs through adaptation — regular divers simply become accustomed to some CO<sub>2</sub> elevation and learn to ignore it. In addition, while diving, their sensors are partially narcotized by nitrogen, and even by high levels of CO<sub>2</sub> itself. Also, high O<sub>2</sub> tension reduces the breathing response to CO<sub>2</sub>.

The above mechanisms all work on the subconscious level, without the diver's intent or permission, but there's another one he brings on himself. This is skip breathing — the practice of purposely breathing slowly in order to stretch the air supply. And this rather imposing list of things that elevate CO<sub>2</sub> is still not complete. Anyone interested in such things as right to left shunts, perfusion-diffusion imbalance, and effort independent exhalation rate limits, we'll gladly provide references to the scientific literature.

The reverse disorder, CO<sub>2</sub> deficit, is much simpler. The only cause is hyperventilation. You breathe too fast and/or too deeply, and your CO<sub>2</sub> level drops. Just as doubling the normal 40 torr to 80 will verge you on collapse, so will halving it to 20. Any armchair investigator can convince himself by simply breathing hard for a few minutes. Hyperventilation occurs in two dive situations. One is cold exposure, and the other is apprehension, and who among us hasn't experienced both?

High O<sub>2</sub> tension (less than convulsive level) is known to favor syncope — Dr. Miles proved that. How, we don't know. We know it leads to vasoconstriction and reduces circulation to the brain. It can result in CO<sub>2</sub> retention. We also know O<sub>2</sub> has narcotic properties. Beyond this, all is conjecture. All sport divers of course expose themselves to O<sub>2</sub> levels above normal, by virtue of breathing compressed air. Those who charge their tanks with pure O<sub>2</sub> or O<sub>2</sub> rich mixtures run a greater risk.

Low O<sub>2</sub> tension is rare in scuba divers (at least those who don't run out of air), yet they've found some ingenious ways to achieve it. One is using a tank in which moisture has caused rusting, which binds CO<sub>2</sub> as iron oxide and leaves nitrogen as the breathing gas. A more innovative way is to use a home made O<sub>2</sub> rebreather, and forget to purge the nitrogen out: again you wind up breathing just nitrogen. Automatic rebreathers and semi-closed circuit rigs which malfunction could have similar results.

The classic example of hypoxic syncope is the breath-hold diver who hyperventilates before his plunge. He adds lit-



tle O<sub>2</sub> to his stores, since most is carried in hemoglobin, which was already saturated, but he does blow off a lot of CO<sub>2</sub> from its chemical reservoirs in the blood. He then dives, and by the time he has generated enough new CO<sub>2</sub> to tell him it's time to breathe, his O<sub>2</sub> stores have been largely consumed. The exercise and the mental set on accomplishment further blunt his urge to breathe. Also the compression of his lung air at depth raises its O<sub>2</sub> tension, so that he can use a larger per cent of the O<sub>2</sub> than he could topside. When he finally does ascend, it re-expands. This lowers its CO<sub>2</sub> tension, taking the edge off the urge to breathe, but at the same time lowers its already tiny O<sub>2</sub> tension below the level that can sustain consciousness. Below the surface, he'll be negatively buoyant, sink, and drown. This "shallow water blackout" kills mainly the experts — the ones who can stay down the longest.

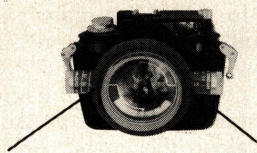
We now move to an entirely different kind of syncope producing event: the heart doesn't pump enough blood. In divers with supposedly good hearts, this can come about in four ways. Too slow a beat is obvious. Too fast a beat can be as bad — there's not time for filling between beats, so the heart contracts on nearly empty chambers. If the great veins are slow about returning blood to the heart, it can't pump what it doesn't get. Or the heart may be pumping blood just fine, yet still not be able to meet an excessive demand.

What would slow a diver's heart? At least three things. First, there's our own special diver's reflex. It requires a wet face and breath holding, more typical of the free diver wearing goggles, but also possible in a scuba diver with flooded or lost mask. Second, there's the carotid sinus reflex. We all have as standard equipment pressure sensors in the carotid arteries, which slow the heart when the blood pressure gets too high. A good idea. But in sensitive people external massage sets them off too, and a wet suit neck seal can do a fair job of massage. Third is the valsalva maneuver, which is to close the mouth, hold the nose, and blow. This just happens to be for many divers, a favorite method of clearing their ears. And as if these weren't enough, the heart can also be slowed by other vagus nerve reflexes set off by any number of stimuli such as icy water, a full bladder, etc.

Too fast a heart rate may result from anything that stimulates the sympathetic nervous system, or the glands that make adrenaline. Excitement, fright, and panic are examples. Stimulating drugs are a common cause — the caffeine in many beverages and headache pills, and the ephedrine like drugs in decongestants. Various reflexes can whip up the heart, as can also certain heart disorders or an overactive thyroid gland.

Conditions which reduce return of venous blood to the heart can be impor-

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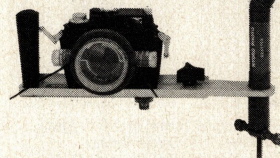
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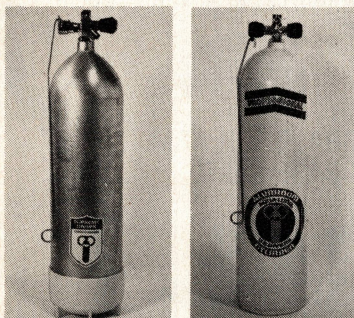




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## Medifacts

tant. They include the valsalva maneuver, for blowing against a closed mouth and nose raises the pressure in the chest above that in the great veins and tends to collapse them. Breath holding during ascent, due to the pressure of expanding air in the lungs, can have the same effect.

Relative insufficiency of heart output might occur in a fellow who has no buoyancy control vest, and is striving mightily to lug a heavy goody bag on the surface. His heart is putting out maximally, but can't long handle the unreasonable demand. It will go on strike even sooner if its owner has unwisely consumed a large meal just before the dive, so that his stomach and intestines usurp part of the heart output.

Psychological state is of great importance. Fear can bring on psychosomatic syncope — all body systems are go, but the mind goes on strike and the diver behaves as though unconscious. People convinced they will die during surgery often do so, and no one should dive if he really has a negative feeling about it.

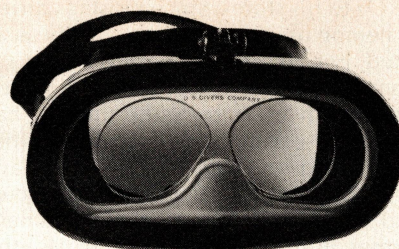
Certain temporary physical states affect dive safety, too. Fatigue is one. Another is low blood sugar due to vomiting, hunger, or a faulty physiological control system (reactive hypoglycemia). These predispose to narcosis, bends, and heart dysrhythmias. So does any acute illness, including alcohol intoxication, hangover, and flu. Any chronic disorder — epilepsy, diabetes, anemia — imposes its own special risk. Drugs can have totally unpredictable effects, often turning a safe diver into an accident looking for a place to happen.

To sum up, we emphasize that underwater blackout is a very real phenomenon. It can happen, usually without warning, at any depth and at any time during a dive. The important thing to remember about its cause is the idea of summation. When a diver's in good shape and behaving himself, no single adverse effect is likely to lay him low. Yet a combination of syncope producing factors can easily provide all the excuse he'll ever need to retire permanently.

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"Safety is my main concern," states Bill Crawford, owner of Bill Crawford's Tropic Island Dive Shop in Key Largo, Florida.

Bill believes that the buoyancy compensator is an integral part of scuba safety equipment. Therefore, after December 1, 1976, all scuba divers planning to dive from one of the dive shop's charter boats will be required to be equipped with a buoyancy compensator. Safety vests will be allowed for snorkelers only.



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Robin Lehman made history by winning Academy Awards in two consecutive years in the Short Documentary Category — he won the 1974 Award for *Don't*, the saga of a Monarch butterfly; the 1975 Award was presented to him for *The End of the Game*, a stunning film on African wildlife.



In addition to his two Academy Awards, Mr. Lehman has garnered top prizes from such diverse international film festivals as Atlanta, Barcelona, Berlin, Chicago, Cork, Krakow, Moscow, and San Francisco. He also received the highly coveted Grand Prix de la Commission Supérieure Technique de Cinema Francais.

Lehman, who was educated at Brooks School in North Andover, Mass., and at Yale, did not set out to be a filmmaker.

"I studied art from about the time I was six," says the tall New Yorker, "When I was about 20 my interest shifted from my eyes to my ears, and I spent the next ten years in Paris studying with Nadia Boulanger."

Somewhere along the line it occurred to Lehman that the one medium where he could combine and use both his audio and visual interests was motion pictures.

"I began by trying to get work with other filmmakers," he remembers, "but nobody would have me."

Undaunted, he got himself a movie camera and started taking pictures. Being a model plane enthusiast, he decided to photograph what he knew. Out of that footage came his first short, *Wings and Things*.

He then turned to another subject he knew well — diving. Many underwater enthusiasts have enjoyed the results of these efforts. His underwater films, *Undercurrents*, *Nightlife*, *See*, and *Sea Creatures*, all have very imaginative sound tracks with fantastic cinematography.

To date, Lehman has produced, directed, and photographed 12 highly regarded short films. As for the future, Lehman says that "everything has been a preparation for going on to make feature films." And that is exactly what he will be doing soon when he begins shooting *The Wind Witch*, a delightful live action fantasy set in New York City.



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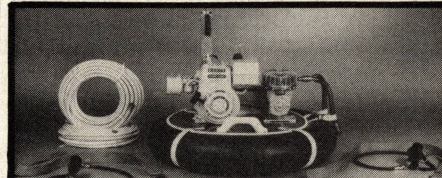
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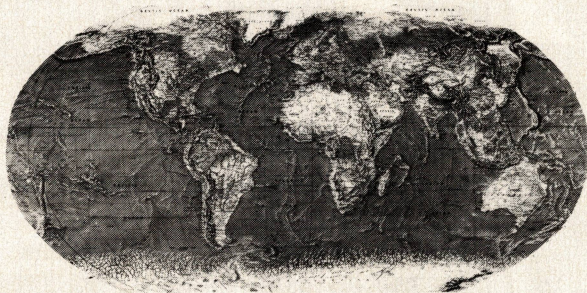
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SDHA9

## Photo Class

(Continued from Page 45)

close shot. Our leader was nearby so I swam over and tried to indicate that I couldn't loosen the clamp; it was too tight. To my total disbelief, Paul whipped out a pair of pliers and loosened it for me. I would give up all my other pictures to have one of Paul Tzimoulis using a pair of pliers on a camera underwater.

As darkness settled over the *Havaiki* and the coals in the barbecue faded we suited up for a night dive in the spot which was now comfortably familiar. The whole class was in a turmoil of preparation yet quite unprepared. Paul "Mickey Moused" lights on the strobes with his endless ingenuity and unlimited supply of tools, and we soon were all in the water for the totally different and marvelous experience of diving in the dark to see the changes which occur at night: polyps feeding; urchins in full, flowery bloom; parrotfish peacefully asleep on the bottom wrapped in their cocoons; and the few nighttime personalities who were startled into hiding as our lights picked out their radiant colors in the surrounding blackness. I, for one, could only speculate that even if no pictures were worth keeping the day would still have been perfect.

It didn't seem possible that the last day had sneaked up on us so quickly. Appalled, we went to the final lecture which was named, appropriately enough, "Diagnosing Your Mistakes." After demonstration slides that had us all laughing heartily, we laughed harder — but with tears in our eyes — at the new batch of returned filmstrips. There was such an assortment of mistakes that Paul decided to add some of them to his collection for demonstrations of what not to do. Our strobes were sometimes facing the wrong direction, there were straps of hoses making patterns across some pictures, decapitated heads stared from the bottom of some, middle sections were beautifully contained, blue water was the complete subject in others, and one roll came back completely unexposed. We'll never know how that happened.

The class was still using close-up lenses; but before scattering in all directions, we met underwater for what must certainly be the strangest class portrait ever taken. Then we separated to inspect the reef and I was rewarded with a miniature lion fish — which I would probably never have seen if Paul hadn't pointed him out to me — and, courtesy Dewey, a shy octopus which changed colors and textures before finally getting desperate and shooting his ink at us as he scrambled away. No one wanted to leave this lovely spot. The second, and, for those who wished, third dive were here also. But there was no avoiding the inevitable. The only saving grace of the conclusion of our class was looking forward to our

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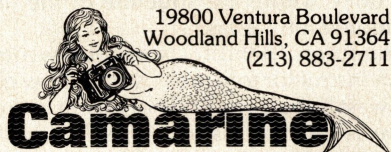
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farewell party as a, perhaps not too likely, climax to a fantastic trip. We had more slides, more movies, a beautiful dinner and two presentations. One presentation was to our leader whom we had so quickly learned to love; and one was to each class member from the crew with one characteristic per diver on a Certificate of Achievement Awards for such accomplishments as "most quickly in the water," "most time spent on the trampoline" and "most often taking pictures with the shutter speed on rewind."

I suppose it might be difficult to understand how a few strangers can become so close in such a short time. Shared experiences, shared laughter, the camaraderie of a single purpose welded together by a common love of the sea, gave a feeling of oneness to this group. We had come to learn about taking pictures. The seminar had proven that, in a completely casual setting, one can learn a great deal. The new friendships proved that it doesn't take long to relax with others. Saying goodbye was painful. It was so short, this excursion into beauty, and leaving it was so difficult. But at the final moment of parting, as everyone glanced quickly at the last returned filmstrips, we all knew that we were taking a little part of it home with us. Next time—please—we'll start on a higher rung of the ladder than our beginning just a few days ago.

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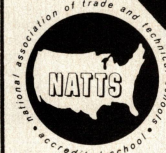
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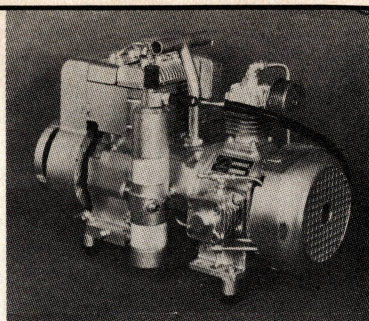


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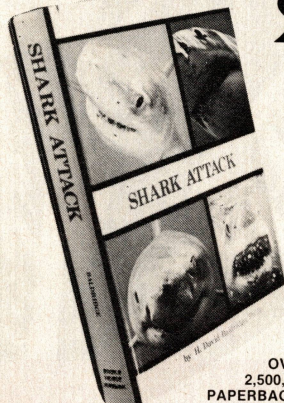
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## Technifacts

from a Master Diver



(Continued from Page 24)

limit). The diver is now rated a G diver as he surfaces, or nearly surfaces if he stops at 33 feet or less. If he stays at 33 feet or returns to 33 feet, his repetitive dive time for that depth (using 40 feet) is 87 minutes. Going back to the no-decompression table you will find the diver can now spend a total time of about 300 minutes less the 87, or 213 minutes remaining bottom time at depths of 33 feet or less. For practical purposes this is an unlimited time with scuba. But it is in fact limited to those times set forth in the tables.

Now suppose a diver makes a dive that does require decompression. How does this affect his desired dive at shallow depths? Suppose the diver again makes a dive to a depth of 100 feet but this time he stays for 50 minutes. A dive that would require a total decompression time of 27 minutes and 40 seconds. The deepest stop is at a depth of 20 feet. In other words, the diver has accumulated tissue nitrogen pressure to the extent that he will continue to in-gas until he reaches a depth of 20 feet. If he stays at a depth of 33 feet he will continue to absorb more nitrogen than was in his tissues prior to arrival at that depth and he will require decompression. However, if the diver ascends through the decompression stops and makes a repetitive dive according to the tables there would be no problems. In the above example the diver would take his 20 and 10 foot stops. Then, after a brief time, descends to a depth of 33 feet or less he can stay for a period of time not to exceed 300 minutes less the time designated in the repetitive dive tables (the diver was an L diver following his dive. According to the tables this would leave 300 minutes less the 187 as an L diver or a total bottom time remaining of only 113 minutes.

As pointed out in the decompression tables, depths of less than 33 feet do not have specific no-decompression limits. Times are restricted, however, because they provide repetitive group designators. If any diving is either planned or might become necessary, *all diving* must be done within the structure of the decompression tables.

Another Technifacts reader wrote, "An instructor told me I could follow my slowest bubbles as a rate of ascent from a dive as decompression rate. Is this true?"

Not necessarily true. Rate of ascent from a dive must be as prescribed in the decompression tables in use. In the latest Navy tables, the rate of ascent must be 60 feet per minute. If you go slower or faster



than this your decompression stop times must be adjusted. Before you dive, get a set of decompression tables, learn how to use them, and then follow them, particularly as to the rate of ascent.

**Wearing Contact Lenses While Diving!** "Is it possible to wear contact lenses while diving?" This reader also asked a question for Shellfacts column which I will get to in that column.

I know several divers who wear contact lenses while sport diving with mask, flippers, snorkel and scuba. Occasionally these divers bemoan the fact they have lost one or both of their lenses.

Probably a better answer to vision problems underwater is to have your prescription ground into the face plate of your mask. Optometrists who do this work are frequent advertisers in SKIN DIVER. Check for their ads.

**Harmful Gases In Scuba Air!** In 1975 several letters were received from readers regarding the possibility of harmful gases being found in scuba air supplies. Technifacts for August, 1975, discussed these potential problems. Since then correspondence has gone on about the problem, one series of letters were with Dennis K. Sponholtz, a graduate student in the Department of Chemistry, Northwestern University. His most recent letter is quoted, in part, below as it helps clarify some of the issues not covered fully in the previous Technifacts.

"This is a belated reply to your most recent note. I was delayed by the necessity of writing my thesis, finding a job, and moving to Buffalo. First, nitrous oxide does, in fact, have a slightly sweetish odor and taste ascribed to it in the August, 1975, Technifacts column.

"As for the potential hazard of the oxides of nitrogen as pollutants in scuba air, as far as I have been able to discover, there are none. I have researched a number of chemical source books, as well as laboratory and industrial safety handbooks. Nitrogen dioxide, which is extremely toxic, and an important contributor to photochemical smog, is rapidly destroyed by contact with water. In any reasonable compressor, the minute traces possibly present in the atmosphere should readily be removed. It is conceivable that a compressor without filters could present a potential hazard. The choking odor (of nitrogen dioxide) is an unmistakable warning.

"The final common oxide  $N_2O$ , nitrous oxide, or laughing gas, does not, from what I have been able to discover, seem to be a likely pollutant. Its presence, however, would cause problems, especially early narcosis, in the diver.

"I am presently working as a postdoctoral research associate in the Environmental Physiology Lab at Buffalo and will be doing related respiratory physiology and I may discover that these conclusions, drawn from chemical literature, are entirely erroneous. If so, will hear from me again."

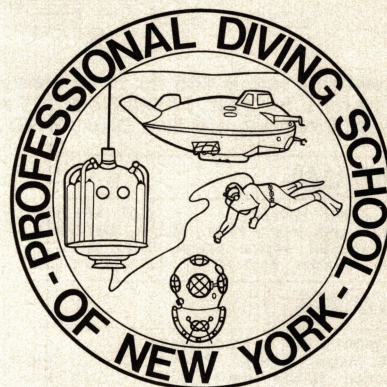
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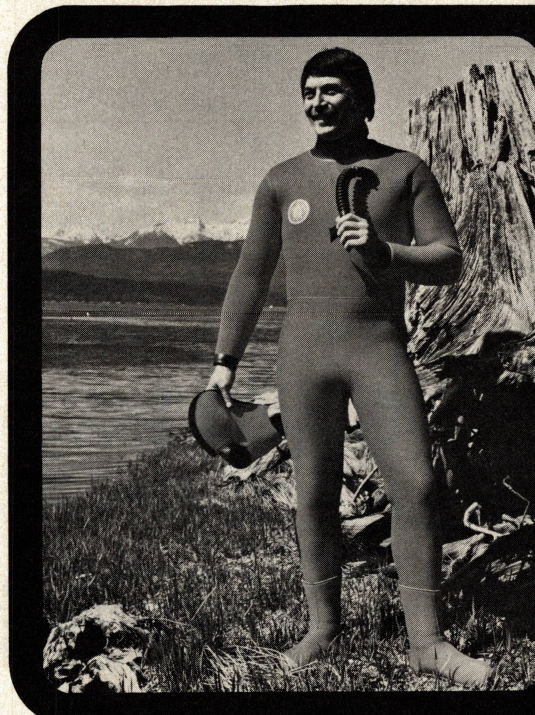
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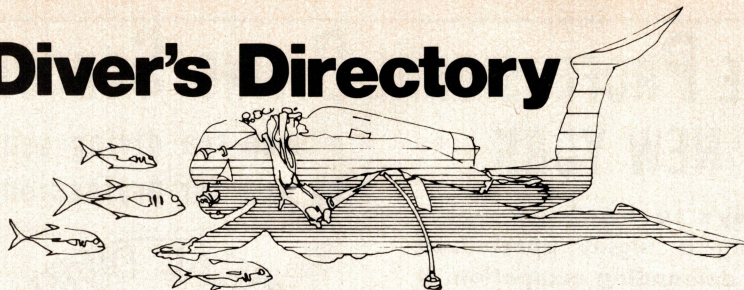


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(continued from preceding page)

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## 7th FSDA Fin Swim

The Florida Skin and Scuba Divers As-  
sociation, in conjunction with Underwa-  
ter Society of America, is sponsoring the  
7th Annual Fin Swim at their quarterly  
meeting November 12, 13, and 14.

The weekend is planned with some-  
thing for everyone. There will be guest  
speakers, many displays, and the Fin  
Swim on Saturday, the 13th.

Fin Swim rules are according to regula-  
tions set by the Underwater Society of  
America. The contestants must use and  
finish the race wearing a mask, snorkel,  
and fins. Trophies will be awarded to all  
of the winners.

Because the surf is usually pretty rough  
in November, the race will be held at the  
campus of the University of North  
Florida on Lake Oneida. The Sea Turtle Inn  
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For more information and schedule of  
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\_\_\_ Knee

\_\_\_ Thigh

\_\_\_ Hips

\_\_\_ Waist

\_\_\_ Chest

\_\_\_ Neck

\_\_\_ Wrist

\_\_\_ Forearm

\_\_\_ Elbow

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## West Coast Nature Trail

The first Federal underwater nature trail on the west coast is to be established at Anacapa Island, off Southern California. The National Park Service signed an agreement with the Santa Barbara Underseas Foundation to begin work on the trail. The Underseas Foundation is a nonprofit organization devoted to educating the public about the ocean.



William Ehorn, National Park Service Superintendent at Channel Islands National Monument, Oxnard, California, signs an agreement initiating the first Federal underwater nature trail on west coast. Vic Bates (left) and Phil Hawthorne (right) of the Santa Barbara Underseas Foundation watch the ceremony.

The trail, located in Cathedral Cove at east Anacapa, will cover some 10 acres of ocean floor. Illustrated underwater signs will tell visiting divers about the marine life found along the trail. The trail will be slated as an ecological preserve, which will prevent the removal of anything from the site.

Funds are urgently needed for this project. Interested parties should contact the Santa Barbara Underseas Foundation, P.O. Box 4815, Santa Barbara, Ca 90103.

## Dr. Henry Frey New Alpine Director

The new Director of Physical Oceanography and Ocean Engineering, Dr. Henry R. Frey, was announced by Alpine Geophysical Associates, Inc. of Norwood, New Jersey. Dr. Frey comes to Alpine with a wealth of experience as research associate professor of oceanography at Polytechnic Institute, as principal investigator for the U.S. Ship of Opportunity Program, and for the Investigation of Naturally Occurring Waterborne Turbulence by Stereophotogrammetry. As research scientist at Uniroyal Research Center he worked in hydromechanics, acoustics and the development of a standing wave/tone burst tube for measuring hydroacoustic impedance. As an experienced diver he has developed improvements in dive technology and stereophotogrammetry. His affiliation with Alpine will center on physical oceanographic projects and ocean engineering.

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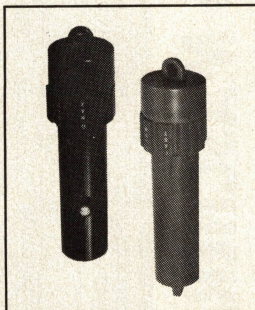
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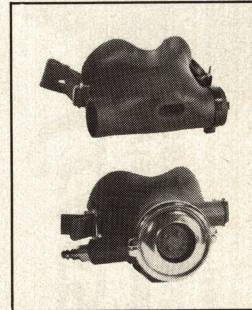
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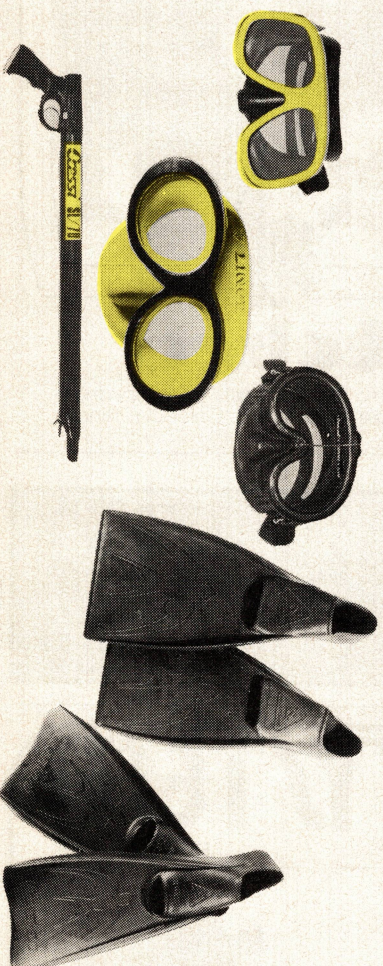
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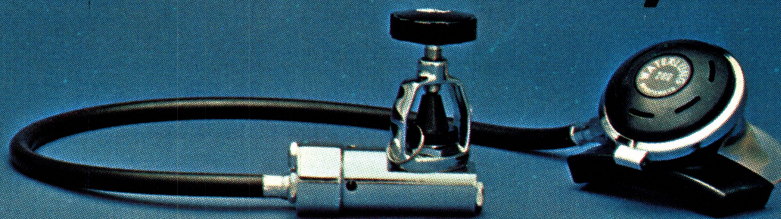
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